Requirements for Installing Oracle Database 12.1 on RHEL6 or OL6 64-bit (x86-64) (Doc ID 1529864.1)

In this Document

APPLIES TO:

Oracle Database - Enterprise Edition - Version 12.1.0.1 and later
Oracle Database - Standard Edition - Version 12.1.0.1 and later
Linux x86-64

PURPOSE

This note explains the requirements that need to be met for a successful installation of Oracle Database 12.1 release on Red Hat Enterprise Linux 6.0 or Oracle Linux 6 (or higher 6.x version) 64-bit (x86-64)

It is NOT the purpose of this NOTE to repeat every "how-to" step that is presented in the Oracle Database 12.1 Installation Guide. For example this NOTE does not include how to create the Linux OS account named "oracle", nor does it cover how to set environment variables. Both are adequately covered in "Oracle® Database Installation Guide 12c Release 1 (12.1) for Linux"

SCOPE

This procedure is meant for those Planning / Installing Oracle Database 12.1 on RHEL 6.0 on the 64-bit (x86-64) platform. Since it is the expressed goal to keep Oracle Linux (OL) functionally IDENTICAL to RHEL, this NOTE is also completely applicable to 64-bit (x86-64) OL 6.0

This procedure is not meant for those Planning / Installing Grid Infrastructure (GI) or any other Oracle products.

DETAILS

Requirements for installing Oracle Database 12.1 release 64-bit on RHEL6 or OL6 64-bit (x86_64)

Before you proceed with Installation, please take time to review every below requirement carefully to avoid any obvious issues during Installation of binaries.

1. Download the Oracle Database 12.1 Software

- Download the Oracle Database 12.1 software from My Oracle Support
Note 1194734.1 Where do I find that on My Oracle Support (MOS) [Video]

- After you download the Software, Verify the integrity of the Downloaded Software
Note 549617.1 How To Verify The Integrity Of A Patch/Software Download? [Video]

- If you have downloaded the Software on other Machine, please transfer the zip file on the Server being Installed using Binary Mode and unzip with the Oracle Software user.

I. Hardware:

1. Minimum Hardware Requirements

a.) Ensure that your system meets the following Physical Memory requirements:
Minimum: 1 GB of RAM
Recommended: 2 GB of RAM or more

b.) Swap disk space proportional to the system's physical memory as follows:

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

NOTE: The above recommendations (from the Oracle® Database Installation Guide 12c Release 1 (12.1) for Linux) are MINIMUM recommendations for installations. Further RAM and swap space may be required to tune/improve RDBMS performance.

c.) 1.0 GB (1024MB) of disk space (and less than 2TB of disk space) in the /tmp directory.

If the free space available in the /tmp directory is less than what is required, then complete one of the following steps:
- Delete unnecessary files from the /tmp directory to meet the disk space requirement.
- Set the TMP and TMPDIR environment variables when setting the oracle user's environment.

d.) Approximately 6.5 GB of local disk space for the Database Software Files.

e.) If you intend to create a preconfigured database during the installation, then the file system (or file systems) that you choose must have at least 2 GB of free disk space.
For production databases, you must estimate the disk space requirement depending on the use of the database.

2. Oracle Database is supported on ext2, ext3 and ext4 file systems (see Note:236826.1 for further information)

II. Software:

1. Certified Linux Operating Systems

Oracle Linux 6
Red Hat Enterprise Linux 6

2. Oracle recommends that you install the Linux operating system with the default software packages (RPMs) and do not customize the RPMs during installation. For additional information on "default-RPMs", please see Note 376183.1, "Defining a "default RPMs" installation of the RHEL OS" or Note 401167.1, "Defining a "default RPMs" installation of the Oracle Enterprise Linux (OEL) OS".

3. Linux Kernel Requirements

Oracle Linux 6 with the Unbreakable Enterprise kernel: 2.6.39-200.24.1.el6uek.x86_64 or later

Oracle Linux 6 with the Red Hat Compatible kernel: 2.6.32-71.el6.x86_64 or later
Red Hat Enterprise Linux 6: 2.6.32-71.el6.x86_64 or later
Red Hat Enterprise Linux 6 with the Unbreakable Enterprise Kernel: 2.6.32-100.28.5.el6.x86_64 or later

Note 1508516.1 Is It Mandatory To Install UEK Kernel Under RHEL?

4. Required OS Components (per Release Notes, and Install Guide)

a.) The exact version number details of this list are based upon 64-bit (x86_64) RHEL 6.0. When a higher "update" level is used, the RPM release numbers (such as 4.4.4-13) may be slightly different. Since updates of RHEL 6 are certified, this is fine so long as you are still using 64-bit Linux (x86_64) RHEL 6 RPMs.

b.) Some of the Install Guide requirements will already be present from the "default-RPMs" foundation of Linux that you started with:

1. binutils-2.20.51.0.2-5.11.el6 (x86_64)
2. glibc-2.12-1.7.el6 (x86_64)
3. libgcc-4.4.4-13.el6 (x86_64)
4. libstdc++-4.4.4-13.el6 (x86_64)
5. libaio-0.3.107-10.el6 (x86_64)
6. libXext-1.1 (x86_64)
7. libXtst-1.0.99.2 (x86_64)
8. libX11-1.3 (x86_64)
9. libXau-1.0.5 (x86_64)
10. libxcb-1.5 (x86_64)
11. libXi-1.3 (x86_64)
12. make-3.81-19.el6
13. sysstat-9.0.4-11.el6 (x86_64)

c.) The remaining Install Guide requirements will have to be installed:

1. compat-libcap1-1.10-1 (x86_64)
2. compat-libstdc++-33-3.2.3-69.el6 (x86_64)
3. gcc-4.4.4-13.el6 (x86_64)
4. gcc-c++-4.4.4-13.el6 (x86_64)
5. glibc-devel-2.12-1.7.el6 (x86_64)
6. ksh <== any version of ksh is acceptable
7. libstdc++-devel-4.4.4-13.el6 (x86_64)
8. libaio-devel-0.3.107-10.el6 (x86_64)

d.) Customers wishing to install the Oracle Database 12.1 32-bit Client software should also install these packages:

1. compat-libstdc++-33-3.2.3-69.el6 (i686)
2. glibc-2.12-1.7.el6 (i686)
3. glibc-devel-2.12-1.7.el6 (i686)
4. libgcc-4.4.4-13.el6 (i686)
5. libstdc++-4.4.4-13.el6 (i686)
6. libstdc++-devel-4.4.4-13.el6 (i686)
7. libaio-0.3.107-10.el6 (i686)
8. libaio-devel-0.3.107-10.el6 (i686)

9. libXext-1.1 (i686)
10. libXtst-1.0.99.2 (i686)
11. libX11-1.3 (i686)
12. libXau-1.0.5 (i686)
13. libxcb-1.5 (i686)
14. libXi-1.3 (i686)

5. Additional Required OS Components (per the runInstaller OUI)
   a.) intentionally blank

6. Additional Required OS Components (per this NOTE)

   a.) Please do not rush, skip, or minimize this critical step. This list is based upon a "default-RPMs" installation of 64-bit (x86_64) RHEL Server 6. Additional RPMs (beyond anything known to Oracle) may be needed if a "less-than-default-RPMs" installation of 64-bit (x86_64) RHEL Server 6 is performed. For more information, please refer to Note 376183.1, "Defining a "default RPMs" installation of the RHEL OS"

   b.) Several RPMs will be required as prerequisites to those listed in section II.3.c:

```
cloog-ppl.x86_64 0:0.15.7-1.2.el6
cpp.x86_64 0:4.4.6-4.el6
glibc-headers.x86_64 0:2.12-1.80.el6
kernel-headers.x86_64 0:2.6.32-279.el6
mpfr.x86_64 0:2.4.1-6.el6
ppl.x86_64 0:0.10.2-11.el6
redhat-release-6Server-1.noarch (only for RHEL)
```

7. Oracle Global Customer Support has noticed a recent trend with install problems that originates from installing too many RPMs. For example:

   a.) Installing your own JDK version (prior to execute the Oracle Software runInstaller) is not needed on Linux, and is not recommended on Linux. A pre-existing JDK often interferes with the correct JDK that the Linux Oracle Software runInstaller will place and use.

   b.) Installing more than the required version of the gcc / g++ RPMs often leads to accidentally using (aka enabling or activating) the incorrect one. If you have multiple RDBMS versions installed on the same Linux machine, then you will likely have to manage multiple versions of gcc /g++ . For more information, please see Note 444084.1, "Multiple gcc / g++ Versions in Linux"

8. All of the RPMs in section II. are on the Red Hat Enterprise Linux 6 64-bit (x86_64) distribution media.

III. Environment:

1. Below are the Minmum Recommended Kernel Parameter settings required for Database Software Installation. Modify your kernel settings in /etc/sysctl.conf as follows.

   NOTE: If the current value for any parameter is higher than the value listed, do not change the value of that parameter.

kernel.shmall = 1/2 of physical memory in pages, this will be the value 2097152. See Note 301830.1 for more information.
kernel.shmmax = 1/2 of physical memory in bytes. This would be the value 2147483648 for a system with 4GB of physical RAM.

For 32-bit Linux Systems :

Minimum: 536870912 (512 MB)
Maximum: A value that is 1 byte less than 4 GB, or 4294967295
Recommended: More than half the physical memory

For 64-bit Linux Systems :
Minimum: 536870912 (512 MB)
Maximum: A value that is 1 byte less than the physical memory
Recommended: More than half the physical memory

See My Oracle Support Note 567506.1 for additional information about configuring shmmax.

kernel.shmmni = 4096
kernel.sem = 250 32000 100 128
fs.file-max = 6815744
fs.aio-max-nr = 1048576

Note: This value limits concurrent outstanding requests and should be set to avoid I/O subsystem failures.

net.ipv4.ip_local_port_range = 9000 65500
net.core.rmem_default = 262144
net.core.rmem_max = 4194304
net.core.wmem_default = 262144
net.core.wmem_max = 1048576

Note: The below Kernel Parameter "panic_on_oops=1" is being Introduced and required from 12.1.0.2.0 onwards.

kernel.panic_on_oops=1

2. To activate these new settings into the running kernel space, run the "sysctl -p" command as root.

3. Set Shell Limits for the oracle User. Assuming that the "oracle" Unix user will perform the installation, do the following:

a.) Add the following settings to /etc/security/limits.conf configuration file for the installation owner.

```
oracle           soft    nproc    2047
oracle           hard    nproc    16384
oracle           soft    nofile    1024
oracle           hard    nofile    65536
oracle           soft    stack    10240
oracle           hard    stack    10240
```

NOTE: When the limits.conf file is changed, these changes take effect immediately. However, if the oracle users are logged in, then these changes do not take effect until you log these users out and log them back in. You must do this before you use these accounts for installation.

b.) Verify the latest version of PAM is loaded, then add or edit the following line in the /etc/pam.d/login file, if it does not already exist:

```
session required pam_limits.so
```

c.) Verify the current ulimits, and raise if needed. This can be done many ways...adding the following lines to /etc/profile is the recommended method:

```
if [ $USER = "oracle" ]; then
   if [ $SHELL = "/bin/ksh" ]; then
      ulimit -u 16384
      ulimit -n 65536
   else
      ulimit -u 16384 -n 65536
   fi
fi
```

4. The gcc-4.1.2 and gcc-c++-4.1.2 RPM items above will ensure that the correct gcc / g++ versions are installed. It is also required that you ensure that these correct gcc / g++ versions are active, and in-use. Ensure that the commands "gcc --version" and "g++ --version" each return "4.1.x".

5. The hostname command should return the fully qualified hostname as shown below:

```
% hostname
hostname.domainname
```

6. If any Java packages are installed on the system, unset the Java environment variables, for example JAVA_HOME.

7. The oracle account that is used to install Oracle Database 12.1, should not have the Oracle install related variables set by default. For example setting ORACLE_HOME, PATH, LD_LIBRARY_PATH to include Oracle binaries in .profile, .login file and /etc/profile.d should be completely avoided.

a.) Setting $ORACLE_BASE (not $ORACLE_HOME) is recommended, since it eases a few prompts in the OUI runInstaller tool.
b.) Following the successful install, it is recommended to set $ORACLE_HOME, and to set $PATH to include $ORACLE_HOME/bin at the beginning of the $PATH string.

8. By default, RHEL 6 x86_64 Linux is installed with SELinux as "enforcing". This is fine for the Oracle Database 12.1 installation process.

9. Log in as Oracle user and start the installation as follows:

```
./runInstaller
```

a.) It is best practice not to use any form of "su" to start the runInstaller, in order to avoid potential display-related problems.
b.) When performing the Oracle Database 12.1 installation, make sure to use the "runInstaller" version that comes with Oracle Database 12.1 software.
c.) When performing any subsequent 12.1.0.x patchset, make sure to use the "runInstaller" version that comes with the patchset.

ADDITIONAL NOTES

1. Starting from Oracle Database 12.1 32-bit Oracle Database Software is not available.

2. Supported distributions of the 32-bit (x86) Oracle Database Client Linux OS can run on on AMD64/EM64T and Intel Processor Chips that adhere to the x86_64 architecture. Oracle 32-bit Database Client running on AMD64/EM64T with 64-bit OS is expected to be supported, but is NOT covered by this NOTE.

3. Asynchronous I/O on ext2 and ext3 file systems is supported if your scsi/fc driver supports that functionality.

Note : Asynchronous I/O on Ext4 file system is supported with Oracle 10g onwards on OEL5.6 and later.

Reference : Oracle Linux, Filesystem & I/O Type Supportability (Note 279069.1)

4. No extra patch is required for the DIRECTIO support for x86_64.

5. No LD_ASSUME_KERNEL value should be used with the Oracle Database 12.1 product.

6. The following rpm command can be used to distinguish between a 32-bit or 64-bit package.

```
# rpm -qa --queryformat "%{NAME}-%{VERSION}-%{RELEASE} (%{ARCH})\n" | grep glibc-devel
glibc-devel-2.12-1.7.el6 (x86_64)
glibc-devel-2.12-1.7.el6 (i686)
```

7. Pre-requisite RPM's related to libXi* required inorder to resolve java dependency for OUI and avoid the known issue mentioned in
Note 1569369.1 libXi.so.6: cannot open shared object file: No such file or directory

-

REFERENCES

NOTE:1351051.1 - Information Center: Install and Configure Database Server/Client Installations
NOTE:1520299.1 - Master Note For Oracle Database 12c Release 1 (12.1) Database/Client Installation/Upgrade/Migration Standalone Environment (Non-RAC)
NOTE:1621417.1 - Installation of Oracle 12cR1 Database Software on RHEL6 Fails "INS-13001 Environment Does Not Meet Minimum Requirements" Error