

Oracle® Database

Release Notes

10g Release 2 (10.2) for Linux Itanium

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This document contains important information that was not included in the platform-specific or product-specific documentation for this release. This document supplements *Oracle Database Readme* and may be updated after it is released.

To check for updates to this document and to view other Oracle documentation, refer to the Documentation section on the Oracle Technology Network (OTN) Web site:

<http://www.oracle.com/technetwork/indexes/documentation/index.html>

For additional information about this release, refer to the readme files located in the \$ORACLE_HOME/relnotes directory.

Note: The Database Quick Installation Guides are no longer available in printed format. These documents are available with the media in the same location as the software and on Oracle Technology Network.

This document contains the following topics:

- [Certification Information](#)
- [Unsupported Products](#)
- [Preinstallation Requirements](#)
- [Installation, Configuration, and Upgrade Issues](#)
- [Other Known Issues](#)
- [Documentation Corrections and Additions](#)
- [Documentation Accessibility](#)

1 Certification Information

The latest certification information for Oracle Database 10g Release 2 (10.2) is available on My Oracle Support (formerly *OracleMetaLink*) at:

<https://support.oracle.com>

Pro*COBOL Certification

Pro*COBOL with Micro Focus Server Express 4.0 SP2 is supported on Red Hat Linux 4. However, to work with Pro*COBOL, install the 5037378 patch.

Linux Certification

Starting with Oracle Database 10g Release 2 (10.2.0.4), the following operating systems are supported in addition to the list documented in *Oracle Database Installation Guide for Linux Itanium*:

- Red Hat Enterprise Linux 5
- SUSE Linux Enterprise Server 10

Refer to "[List of Packages for Red Hat Enterprise Linux 5](#)" and "[List of Packages for SUSE Linux Enterprise Server 10](#)" sections for the list of packages for Oracle Database 10g Release 2.

Starting with Oracle Database 10g Release 2 (10.2.0.5), SUSE Linux Enterprise Server 11 is supported in addition to the list documented in *Oracle Database Installation Guide for Linux Itanium*.

Refer to "[List of Packages for SUSE Linux Enterprise Server 11](#)" section for the list of packages for Oracle Database 10g Release 2.

ODBC Certification

Starting with Oracle Database 10g Release 2 (10.2.0.4), Generic Connectivity Using ODBC (64-bit) is supported on Linux Itanium.

2 Unsupported Products

Grid Control is not supported with Oracle Database 10g Release 2 (10.2).

Oracle Database 10g Release 2 (10.2) can be managed as a target by Grid Control 10.1.0.4. However, Oracle Database 10g Release 2 is not supported by Grid Control 10.1.0.4 as a repository.

3 Preinstallation Requirements

You must review the following sections before installing Oracle Database 10g Release 2:

- [Install libaio Before Installing or Upgrading](#)
- [Install oracleasm-support to use ASMLib](#)
- [Configuring Kernel Parameters](#)
- [Prerequisite Check for Kernel Version Fails](#)
- [Oracle HTTP Server on Red Hat Enterprise Linux 4](#)
- [Oracle HTTP Server on Red Hat Enterprise Linux 5](#)

3.1 Install libaio Before Installing or Upgrading

Before upgrading to or installing Oracle Database 10g Release 2, install the `libaio` package.

3.2 Install oracleasm-support to use ASMLib

Install `oracleasm-support` package version 2.0.0.1 or higher to use ASMLib on Red Hat Enterprise Linux 4 Advanced Server or SUSE Linux Enterprise Server 9.

3.3 Configuring Kernel Parameters

After updating the values of kernel parameters in the `/etc/sysctl.conf` file, ensure that you either restart the computer or run the `sysctl -p` command to make the changes of the `/etc/sysctl.conf` file available in the active kernel memory.

On SUSE Linux Enterprise Server 9, ensure that you set the following kernel parameter:

```
disable_cap_mlock = 1
```

On SUSE Linux Enterprise Server 10, ensure that you set the `hugetlb_shm_group` kernel parameter to the `gid` of the group used as the `dba` group. For example, on a system using a group named `dba` with the `dba:!:104:oracle` entry in the `/etc/group` file, the `hugetlb_shm_group` kernel parameter should be set to the following value:

```
hugetlb_shm_group = 104
```

3.4 Prerequisite Check for Kernel Version Fails

If you do not use the `ignoreSysPrereqs` flag when you install Oracle Database on Red Hat Enterprise Linux 3.x, Red Hat Enterprise Linux 4.x, Red Hat Enterprise Linux 5.x, SUSE Linux Enterprise Server 8.x, SUSE Linux Enterprise Server 9.x, SUSE Linux Enterprise Server 10, or SUSE Linux Enterprise Server 11, then the prerequisite check to validate the kernel version might fail.

Workaround:

Ignore the error message and proceed with the installation if your system has one of the following kernel versions (or later):

```
Red Hat Enterprise Linux 3.0:  
2.4.21-20.EL  
Red Hat Enterprise Linux 4.0:  
2.6.9-11.EL  
Red Hat Enterprise Linux 5.0:  
2.6.18-53.EL  
SUSE Linux Enterprise Server 8.0:  
2.4.21-278  
SUSE Linux Enterprise Server 9.0:  
2.6.5-139  
SUSE Linux Enterprise Server 10:  
2.6.16.21  
SUSE Linux Enterprise Server 11:  
2.6.27.19
```

This issue is tracked with Oracle bug 11847748.

3.5 Oracle HTTP Server on Red Hat Enterprise Linux 4

If you intend to use Oracle HTTP server, which is included in Companion CD of Oracle Database 10g Release 2 (10.2) Media pack, refer to the My Oracle Support (formerly Oracle *Metalink*) note 317085.1 for more information about using Oracle HTTP server on Red Hat Enterprise Linux 4.

3.6 Oracle HTTP Server on Red Hat Enterprise Linux 5

If you intend to use Oracle HTTP Server, which is included in Companion CD of Oracle Database 10g Release 2 (10.2) Media pack, refer to the My Oracle Support

(formerly Oracle*Metalink*) note 564174.1 for more information about using Oracle HTTP Server on Red Hat Enterprise Linux 5.

Legacy entry points required by this version of Apache (`libdb.so.2`) are moved to `gdbm-1.8.0-26.2.1.i386`. You must create a symlink using the following command:

```
$ ln -s /usr/lib/libgdbm.so.2.0.0 /usr/lib/libdb.so.2
```

4 Installation, Configuration, and Upgrade Issues

Review the following sections for information about issues that affect Oracle Database installation, configuration, and upgrade:

- [Latest Upgrade Information](#)
- [Default Makefile Issue on Red Hat Enterprise Linux 5](#)
- [Voting Disk Permissions](#)
- [Upgrading Oracle Real Application Clusters Release 9.2](#)
- [Oracle Universal Installer Operating System Prerequisite Checks](#)
- [Installing Oracle Clusterware](#)
- [Adding a Node to a Shared Oracle Clusterware Configuration](#)
- [Installing Enterprise Security Manager](#)
- [Upgrading Oracle Clusterware 10.1.x to Oracle Clusterware 10.2](#)
- [extjob Executable Requires Directory Permissions](#)
- [Modifying a Virtual IP Address Node Application](#)
- [Raw Devices on Red Hat Enterprise Linux](#)
- [Oracle Clusterware Daemon Fails on Computer Restart](#)
- [Configuring Storage Devices for Oracle Clusterware on 2.6 Kernel Distributions](#)
- [Installing Oracle Database Client into an Existing Oracle Home](#)
- [Database Installation Types](#)
- [Oracle Storage Compatibility Program Obsolete](#)

4.1 Latest Upgrade Information

For late-breaking updates and best practices about preupgrades, postupgrades, compatibility, and interoperability discussions refer to note 466181.1 on My Oracle Support (formerly Oracle*MetaLink*) (<https://support.oracle.com>) that links to "10g Upgrade Companion" page.

4.2 Default Makefile Issue on Red Hat Enterprise Linux 5

The default makefile version on Red Hat Enterprise Linux 5 is `make 3.81`. In this makefile version, the default database name (`db_name`) is not recognized by the Oracle clients, which are directly called from the makefile. This issue is seen even on other platforms when makefile version 3.81 is used.

The workaround is to use makefile version 3.79 or use `@db_name` whenever `username/password` is used in the makefile.

4.3 Voting Disk Permissions

In Chapter 4, Section 4.2, "Preparing to Install Oracle Clusterware with OUI," of the *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide for Linux 10g Release 2 (10.2)* for Linux, required voting disk permissions are listed as 644. This is incorrect. Voting disk permissions should be set to 640.

4.4 Upgrading Oracle Real Application Clusters Release 9.2

If you are upgrading a 9.2 Oracle RAC environment to Oracle Database 10g Release 2 on Red Hat Linux 3, then you must apply a patch to GLIBC before proceeding with the Oracle Clusterware installation. Follow the instructions documented in My Oracle Support(formerly OracleMetalink) note 284535.1.

This issue is tracked with Oracle bug 3006854.

4.5 Oracle Universal Installer Operating System Prerequisite Checks

If you are installing Oracle Database 10g on Red Hat Enterprise Linux 5 or SUSE Linux Enterprise Server 10, the current version of Oracle Universal Installer does not recognized these operating systems as supported operating systems and does not perform the installation.

Workaround #1 (recommended): Run the Oracle Universal Installer using the `ignoreSysPrereqs` flag which causes the installer to skip the operating system check and continue with the installation:

```
./runinstaller -ignoreSysPrereqs
```

As a side effect, the installer also skips other checks during the installation.

Workaround #2: On Red Hat Enterprise Linux 5, the installation passes the operating system prerequisite checks if you change each Red Hat Enterprise Linux 5 to Red Hat Enterprise Linux 4 in the `/etc/redhat-release` file. Ensure that you replace the original values in the `/etc/redhat-release` file after the Oracle installation is complete.

Original Value	Changed Value
Red Hat Enterprise Linux server release 5	Red Hat Enterprise Linux server release 4

On SUSE Linux Enterprise Server 10, the installation passes the operating system prerequisite checks if you change each SUSE Linux Enterprise Server 10 to SUSE Linux Enterprise Server 9 in the `/etc/SuSE-release` file. Ensure that you replace the original values in the `/etc/SuSE-release` file after the Oracle installation is complete.

Original Value	Changed Value
SUSE Linux Enterprise Server 10 (x86_64)	SUSE Linux Enterprise Server 9 (x86_64)
VERSION = 10	VERSION = 9

This workaround causes Oracle Universal Installer to consider the system to be running earlier version of the operating system and the operating system check passes. The changes to the release file should be reverted after the installation of all Oracle

software is complete. The changes to the release file could impact the ability of other tools to be properly installed on the operating system.

4.6 Installing Oracle Clusterware

Near the end of the installation of Oracle Clusterware, Oracle Universal Installer prompts for the `CRS_HOME/root.sh` script to be run on all of the nodes in the cluster. When the `root.sh` script is run on the last node in the cluster, the script calls the VIPCA utility, which fails on Red Hat Enterprise Linux 5 and SUSE Linux Enterprise Linux 10. Refer to the "[SRVCTL and VIPCA Utilities Set the LD_ASSUME_KERNEL Parameter](#)" section for more details.

Workaround: Before running the `root.sh` script on the last node in the cluster, alter the `CRS_HOME/bin/vipca` script commenting out lines 119 through 123:

```
arch='uname -m'
#   if [ "$arch" = "i686" -o "$arch" = "ia64" -o "$arch" = "x86_64" ]
#       then
#           LD_ASSUME_KERNEL=2.4.19
#           export LD_ASSUME_KERNEL
#       fi
```

With the lines commented out, `root.sh` should be able to call VIPCA successfully. Ensure that you do not comment out line 118, which sets the `arch` variable as that is needed by the `root.sh` script.

4.7 Adding a Node to a Shared Oracle Clusterware Configuration

Before running `root.sh` in the first node of a shared Oracle Clusterware home, add the following line in the `ORA_CRS_HOME/opmn/conf/ons.config` file:

```
usesharedinstall=true
```

This issue is tracked with Oracle bug 4454562.

4.8 Installing Enterprise Security Manager

To install Oracle Security Manager, install Oracle Database Client and then select the Administrator installation type.

4.9 Upgrading Oracle Clusterware 10.1.x to Oracle Clusterware 10.2

When upgrading from 10.1.x to 10.2, if the host name directory under the `/etc/oracle/scls_scr` directory includes the domain name, then the following error message is displayed when you run the `rootupgrade.sh` script and the Oracle Clusterware stack does not start:

```
A file or directory in the path name does not exist.
/etc/init.cssd[509]: /etc/oracle/scls_scr/host_name/root/cssrun: 0403-005
Cannot create the specified file.
```

Workaround: Move the `/etc/oracle/scls_scr/hostname.domain_name` directory to `/etc/oracle/scls_scr/hostname` and rerun the `rootupgrade.sh` script.

This issue is tracked with Oracle bug 4472284.

4.10 extjob Executable Requires Directory Permissions

To enable the `extjob` executable to locate required libraries, the `$ORACLE_HOME/lib` directory and all of its parent directories must have execute permissions for group and other.

4.11 Modifying a Virtual IP Address Node Application

When modifying the name, IP address, or netmask of an existing virtual IP address (VIP) resource, use the following command:

```
srvctl modify nodeapps
```

and include the existing interfaces for the VIP in the `-A` argument. For example:

```
srvctl modify nodeapps -n mynode1 -A 100.200.300.40/255.255.255.0/eth0
```

This issue is tracked with Oracle bug 4500688.

4.12 Raw Devices on Red Hat Enterprise Linux

When you restart a Red Hat Enterprise Linux 4, or Red Hat Enterprise Linux 5 system, raw devices revert to their original owners and permissions by default. If you are using raw devices with this operating system for the Oracle files, for example, for ASM storage or Oracle Clusterware files, you must override this default behavior. To do this, add an entry to the `/etc/rc.d/rc.local` file for each raw device containing the `chmod` and `chown` commands required to reset them to the required values.

As an example, here are sample entries in a `/etc/rc.d/rc.local` file that control the restart behavior of raw devices for two ASM disk files (`/dev/raw/raw6` and `/dev/raw/raw7`), two Oracle Cluster Registry files (`/dev/raw/raw1` and `/dev/raw/raw2`), and three Oracle Clusterware voting disks (`/dev/raw/raw3`, `/dev/raw/raw4`, and `/dev/raw/raw5`):

```
# ASM
chown oracle:dba /dev/raw/raw6
chown oracle:dba /dev/raw/raw7
chmod 660 /dev/raw/raw6
chmod 660 /dev/raw/raw7
# OCR
chown root:oinstall /dev/raw/raw1
chown root:oinstall /dev/raw/raw2
chmod 660 /dev/raw/raw1
chmod 660 /dev/raw/raw2
# Voting Disks
chown oracle:oinstall /dev/raw/raw3
chown oracle:oinstall /dev/raw/raw4
chown oracle:oinstall /dev/raw/raw5
chmod 644 /dev/raw/raw3
chmod 644 /dev/raw/raw4
chmod 644 /dev/raw/raw5
```

4.13 Oracle Clusterware Daemon Fails on Computer Restart

If different user IDs are used for installing Oracle Database 10g and Oracle Clusterware, then restarting the system results in OCR errors. Refer to the My Oracle Support(formerly OracleMetalink) note 551478.1 for more information.

Workaround: Oracle recommends that you apply patch set 10.2.0.3 or higher to Oracle Clusterware installation before patching Oracle Database.

This issue is tracked with the Oracle bug 4748946.

4.14 Configuring Storage Devices for Oracle Clusterware on 2.6 Kernel Distributions

This section is for database and system administrators who intend to install or migrate to Oracle 10g Release 2 (10.2.0) Oracle RAC on Red Hat Enterprise Linux 5 and who must configure raw devices for Oracle RAC and Oracle Clusterware. The Linux 2.6 kernel with these distributions requires additional configuration steps. The section contains the following topics:

- [Overview of Device Naming Persistence Changes](#)
- [Configuring Raw Devices for Clusterware on Red Hat](#)
- [Relocate Oracle Clusterware Files from Raw to Block Devices](#)

4.14.1 Overview of Device Naming Persistence Changes

With the Linux 2.6 kernel, support for raw devices is deprecated. The preferred way to access block devices is direct input/output to the devices using `O_DIRECT`. Therefore, `/etc/sysconfig/rawdevices` file of Red Hat Enterprise Linux 4 and Oracle Linux 4, and `/etc/udev/rules.d/60-raw.rules` file of Red Hat Enterprise Linux 5 and Oracle Linux 5 are deprecated. For details, refer to the Linux documentation for your 2.6 kernel.

The 2.4 kernel device file naming scheme `devlabel` maintained persistent device file names between server restarts. By default, the 2.6 kernel device file naming scheme `udev` dynamically creates device file names when the server is started, and assigns ownership of them to `root`. If `udev` applies default settings, then it changes device file names and owners for voting disks or Oracle Cluster Registry partitions, corrupting them when the server is restarted. For example, a voting disk on a device named `/dev/sdd` owned by the user `crs` may be on a device named `/dev/sdf` owned by `root` after restarting the server.

To prevent corruption, you must create a custom rules file. When `udev` is started, it sequentially carries out rules (configuration directives) defined in rule files. These files are in the path `/etc/udev/rules.d/`. Rules files are read in lexical order. For example, rules in file `10-wacom.rules` are parsed and carried out before rules in rule file `90-ib.rules`. Where rules files describe the same devices, on Asianux and Red Hat, the **last** file read is the one that is applied. (On SUSE 2.6 kernels, it is the first file read).

4.14.2 Configuring Raw Devices for Clusterware on Red Hat

This section contains the following topics:

- [Configure SCSI_ID to Return Unique Device Identifiers](#)
- [Configure Udev for Persistent Naming of Oracle Clusterware Devices](#)
- [Bind Raw Devices Using Udev](#)
- [Verify Persistent Oracle Clusterware Storage Devices](#)

Configure SCSI_ID to Return Unique Device Identifiers

Before you can configure `udev` to name devices, you must first configure `scsi_id` to return device identifiers, and then ensure that these devices are visible and accessible on all cluster nodes. To do this, complete the following task:

1. Modify the `/etc/scsi_id.config` file by adding or replacing the 'option=-b' parameter/value pair (if it exists) with 'option=-g'. For example:

```
# cd /etc
# cp scsi_id.config scsi_id.config.orig
# grep -v ^# /etc/scsi_id.config
vendor="ATA",options=-p 0x80
options=-g
```

2. Run the command `fdisk (/sbin/fdisk)` to ensure that Clusterware devices are visible. For example:

```
# /sbin/fdisk -l /dev/sdb1 /dev/sde1

Disk /dev/sdb1: 261 MB, 261890048 bytes
9 heads, 56 sectors/track, 1014 cylinders
Units = cylinders of 504 * 512 = 258048 bytes

Disk /dev/sdb1 does not contain a valid partition table

Disk /dev/sde1: 52 MB, 52403200 bytes
2 heads, 50 sectors/track, 1023 cylinders
Units = cylinders of 100 * 512 = 51200 bytes

Disk /dev/sde1 does not contain a valid partition table
```

In some cases, to see newly provisioned or modified) devices on shared storage, you may need to update cluster node operating systems. Do this either by restarting the nodes, or by using commands such as `/sbin/partprobe device`, or `sfdisk -r device`. Resolve any issues preventing cluster nodes from correctly seeing or accessing storage devices you intend to use for Clusterware files before proceeding.

Note: At this point, cluster nodes may refer to the devices using different device file names. This is expected.

3. Run the command `scsi_id (/sbin/scsi_id)` on storage devices from one cluster node to obtain their unique device identifiers. When running the `scsi_id` command with the `-s` argument, the device path and name passed should be that relative to the `sysfs` directory `/sys` (for example, `/block/device`) when referring to `/sys/block/device`. For example:

```
# /sbin/scsi_id -g -s /block/sdb/sdb1
360a98000686f6959684a453333524174

# /sbin/scsi_id -g -s /block/sde/sde1
360a98000686f6959684a453333524179
```

Record the unique SCSI identifiers of Clusterware devices, so you can provide them when required in the following section, "[Configure Udev for Persistent Naming of Oracle Clusterware Devices](#)".

Note: The command `scsi_id` should return the same device identifier value for a given device, regardless of which node the command is run from.

Configure Udev for Persistent Naming of Oracle Clusterware Devices

Configure persistent user-defined naming of Oracle Clusterware device file names in a udev rules file. This step is optional, but recommended.

The default rule files affecting storage devices are rule files 50 and 51. So, create a custom rules file using the format `[number]-[name][.rules]` with a number value greater than 51 to ensure that the device settings you provide are the ones applied. For example:

```
55-oracle-naming.rules
```

To do this, complete the following tasks:

1. Create a custom udev device naming rule file. For example:

```
# touch /etc/udev/rules.d/55-oracle-naming.rules
```

2. Use a text editor such as `vi`, add to the custom device naming rule file the device-matching rules for the storage devices you intend to use with Oracle Clusterware, matching them to the unique SCSI identifiers you determined in the preceding section. For example:

```
# Configure persistent, user-defined Oracle Clusterware device file names
KERNEL=="sd*", BUS=="scsi", PROGRAM=="/sbin/scsi_id -g -u -s %p",
RESULT=="360a98000686f6959684a453333524174", NAME="ocr1", OWNER="root",
GROUP="oinstall", MODE="0640"
KERNEL=="sd*", BUS=="scsi", PROGRAM=="/sbin/scsi_id -g -u -s %p",
RESULT=="360a98000686f6959684a453333524179", NAME="votel", OWNER="oracle",
GROUP="oinstall", MODE="0640"
```

For each rule, if all specified keys (KERNEL, BUS, PROGRAM, RESULT) are matched, then the rule is applied and the specified assignments (NAME, OWNER, GROUP, MODE) are assigned to the device file name. However, if one or more keys are unmatched, then the rule is completely ignored and the default (arbitrary) kernel-assigned device file names are assigned to devices.

Note: Note the following points when using udev for device persistent naming:

- Double equals "==" denote conditionals, while the single equal "=" denotes assignments. However, in Oracle Linux 4 and Red Hat Enterprise Linux 4 there are only single equals playing both the roles.
- Using the NAME keyword replaces the standard /dev/sdb1 name with your own after a restart.

If you want to preserve the standard name /dev/sdb1, use the SYMLINK+= keyword instead of the NAME keyword. This creates a standard Linux symlink and keep the original device name. Programs such as Clusterware, should use the symlink chosen name and not the physical device, which may change after each restart. However, the symlink always points to the correct device.

Note: In the example rules files shown, Oracle Clusterware devices are created with oraInventory group (oinstall). Oracle recommends that you create these devices since this is the right starting point for device permissions, later during the installation they are changed by root.sh. Setting these incorrectly does not prevent a user from running Cluster Verification Utility, it (CVU) prints warnings.

3. Run the command `udevtest (/sbin/udevtest)` to test the udev rules configuration you have created. The output should indicate that the block devices are available and the rules are applied as expected. For example:

```
# udevtest /block/sdb/sdb1
main: looking at device '/block/sdb/sdb1' from subsystem 'block'
udev_rules_get_name: add symlink
'disk/by-id/scsi-360a98000686f6959684a45333524174-part1'
udev_rules_get_name: add symlink
'disk/by-path/ip-192.168.1.1:3260-iscsi-iqn.1992-08.com.netapp:sn.887085-part1'
udev_node_mknod: preserve file '/dev/.tmp-8-17', because it has correct dev_t
run_program: '/lib/udev/vol_id --export /dev/.tmp-8-17'
run_program: '/lib/udev/vol_id' returned with status 4
run_program: '/sbin/scsi_id'
run_program: '/sbin/scsi_id' (stdout) '360a98000686f6959684a45333524174'
run_program: '/sbin/scsi_id' returned with status 0
udev_rules_get_name: rule applied, 'sdb1' becomes 'ocr1'
udev_device_event: device '/block/sdb/sdb1' validate currently present symlinks
udev_node_add: creating device node '/dev/ocr1', major = '8', minor = '17',
mode = '0640', uid = '0', gid = '500'
udev_node_add: creating symlink
'/dev/disk/by-id/scsi-360a98000686f6959684a45333524174-part1' to '.././ocr1'
udev_node_add: creating symlink
'/dev/disk/by-path/ip-192.168.1.1:3260-iscsi-iqn.1992-08.com.netapp:sn.84187085-part1' to '.././ocr1'
main: run: 'socket:/org/kernel/udev/monitor'
main: run: '/lib/udev/udev_run_devd'
main: run: 'socket:/org/freedesktop/hal/udev_event'
main: run: '/sbin/pam_console_apply /dev/ocr1'
```

```
/dev/disk/by-id/scsi-360a98000686f6959684a453333524174-part1
/dev/disk/by-path/ip-192.168.1.1:3260-iscsi-ign.1992-08.com.netapp:sn.84187085-
part1'
```

In the example output, note that applying the rules renames OCR device
/dev/sdb1 to /dev/ocr1.

4. Restart the udev service by running the command `start_udev (/sbin/start_udev)`. Restarting udev applies the udev rules to the devices, including the device file rules you have created. Use the command `ls -l` command to ensure that the rules file has applied the new device names the rules file has applied. For example:

```
# start_udev

# ls -l /dev | grep -e 'ocr1|vote1'
brw-r----- 1 root  oinstall 8, 17 Oct 29 15:31 ocr1
brw-rw---- 1 oracle oinstall 8, 65 Oct 29 15:31 vote1
```

Bind Raw Devices Using Udev

Perform the following steps to bind raw devices using the udev device manager:

1. If the file `/etc/udev/rules.d/60-raw.rules` does not exist, users do not need to create it. However, users can add rules file even if it exists, or create a new rules file with more meaningful name like `61-oracleraw.rules` for the raw devices used with Oracle installations. For example:

```
# touch /etc/udev/rules.d/60-raw.rules
```

or

```
# touch /etc/udev/rules.d/61-oracleraw.rules
```

2. Add the udev raw binding rules to the raw devices rules file you created. For example:

```
vi /etc/udev/rules.d/61-oracleraw.rules
# Raw bind to Oracle Clusterware devices
ACTION=="add", KERNEL=="sd*", PROGRAM=="/sbin/scsi_id -g -u -s %p",
  RESULT=="360a98000686f6959684a453333524174", RUN+="/bin/raw /dev/raw/raw1 %N"
ACTION=="add", KERNEL=="sd*", PROGRAM=="//sbin/scsi_id -g -u -s %p",
  RESULT=="360a98000686f6959684a453333524179", RUN+="/bin/raw /dev/raw/raw2 %N"
t 29 15:31 vote1
```

3. Create a udev raw permissions file

`/etc/udev/rules.d/65-raw-permissions.rules`. For example:

```
# touch /etc/udev/rules.d/65-raw-permissions.rules
```

4. Using a text editor, add the udev raw permission rules to the file
`/etc/udev/rules.d/65-raw-permissions.rules`. For example:

```
# Set permissions of raw bindings to Oracle Clusterware devices
KERNEL=="raw1", OWNER="root", GROUP="oinstall", MODE="640"
KERNEL=="raw2", OWNER="oracle", GROUP="oinstall", MODE="640"
```

5. Test the udev rules by running the `udevtest` command (`/sbin/udevtest`) again to ensure that the rules are applied, and that they create proper permissions for Oracle Clusterware devices. For example:

```
# udevtest /block/sdb/sdb1
main: looking at device '/block/sdb/sdb1' from subsystem 'block'
udev_rules_get_name: add symlink 'disk/by-id/scsi-360a98000686f69
```

```

59684a45333524174-part1'
udev_rules_get_name: add symlink 'disk/by-path/ip-192.168.1.1:3260
-iscsi-iqn.1992-08.com.netapp:sn.84187085-part1'
udev_node_mknod: preserve file '/dev/.tmp-8-17', because it has
correct dev_t
run_program: '/lib/udev/vol_id --export /dev/.tmp-8-17'
run_program: '/lib/udev/vol_id' returned with status 4
run_program: '/sbin/scsi_id'
run_program: '/sbin/scsi_id' (stdout) '360a98000686f6959684a45333
3524174'
run_program: '/sbin/scsi_id' returned with status 0
udev_rules_get_name: rule applied, 'sdb1' becomes 'ocr1'
udev_device_event: device '/block/sdb/sdb1' validate currently
present symlinks
udev_node_add: creating device node '/dev/ocr1', major = '8',
minor = '17', mode = '0640', uid = '0', gid = '500'
udev_node_add: creating symlink '/dev/disk/by-id/scsi-360a9800068
6f6959684a45333524174-part1' to '.././ocr1'
udev_node_add: creating symlink '/dev/disk/by-path/ip-192.168.1.1
:3260-iscsi-iqn.1992-08.com.netapp:sn.84187085-part1' to '.././ocr1'
main: run: 'socket:/org/kernel/udev/monitor'
main: run: '/lib/udev/udev_run_devd'
main: run: 'socket:/org/freedesktop/hal/udev_event'
main: run: '/sbin/pam_console_apply /dev/ocr1 /dev/disk/by-id/scsi-36
0a98000686f6959684a45333524174-part1 /dev/disk/by-path/ip-192.168.1.
1:3260-iscsi-iqn.1992-08.com.netapp:sn.84187085-part1'
main: run: '/bin/raw /dev/raw/raw1 /dev/.tmp-8-17'

```

- Restart udev to implement the rules you have created and tested. For example:

```
# start_udev
```

Verify Persistent Oracle Clusterware Storage Devices

Use the following commands to verify the persistent Oracle Clusterware storage devices:

- Use the `fdisk` command to check device naming. For example:

```

# fdisk -l /dev/ocr1 /dev/vote1

Disk /dev/ocr1: 261 MB, 261890048 bytes
9 heads, 56 sectors/track, 1014 cylinders
Units = cylinders of 504 * 512 = 258048 bytes

Disk /dev/ocr1 does not contain a valid partition table

Disk /dev/vote1: 52 MB, 52403200 bytes
2 heads, 50 sectors/track, 1023 cylinders
Units = cylinders of 100 * 512 = 51200 bytes

Disk /dev/vote1 does not contain a valid partition table

```

- Use the `ls` command to check device ownership. For example:

```

# ls -l /dev | grep -ie 'ocr|vote'
brw-r----- 1 root dba 8, 17 Oct 29 15:31 ocr1
brw-rw---- 1 oracle dba 8, 65 Oct 29 15:31 vote1

```

3. Use the `udevinfo` command to confirm unique SCSI device identifier mappings. For example:

```
# udevinfo -q all -n /dev/ocr1
P: /block/sdb/sdb1
N: ocr1
S: disk/by-id/scsi-360a98000686f6959684a453333524174-part1
S: disk/by-path/ip-192.168.1.1:3260-iscsi-iqn.1992-08.com.netapp:sn.87085-part1
E: ID_VENDOR=NETAPP
E: ID_MODEL=LUN
E: ID_REVISION=0.2
E: ID_SERIAL=360a98000686f6959684a453333524174
E: ID_TYPE=disk
E: ID_BUS=scsi
E: ID_PATH=ip-192.168.1.1:3260-iscsi-iqn.1992-08.com.netapp:sn.84187085
```

4. Use the `raw` and `ls` commands to confirm raw devices are bound. For example:

```
# raw -qa
/dev/raw/raw1: bound to major 8, minor 17
/dev/raw/raw2: bound to major 8, minor 65

# ls -l /dev/raw/raw*
crw-r----- 1 root  oinstall 162, 11 Oct 30 12:54 /dev/raw/raw1
crw-r----- 1 oracle oinstall 162, 21 Oct 30 14:26 /dev/raw/raw2
```

After you have completed configuring and checking raw storage devices, you can proceed to install Oracle Clusterware and Oracle Real Application Clusters.

4.14.3 Relocate Oracle Clusterware Files from Raw to Block Devices

Oracle recommends that you move Oracle Clusterware files from raw devices to block devices.

See Also: *Oracle Database 2 Day + Real Application Clusters Guide* for more information about relocating voting disks and Oracle Cluster Registry files.

4.15 Installing Oracle Database Client into an Existing Oracle Home

Oracle Database Client can be installed in the same Oracle Database home if both products are at the same release level. For example, you can install Oracle Database Client 10g Release 2 (10.2) into an existing Oracle Database 10g Release 2 (10.2) home. If you apply a patch set before installing the client, then you must apply the patch set again.

4.16 Database Installation Types

If you perform a Custom installation, then ensure that you install only the components covered by your license. You cannot install Standard Edition using Custom installation.

4.17 Oracle Storage Compatibility Program Obsolete

Oracle Storage Compatibility Program (OSCP) is no longer valid. Disregard any content about OSCP in the *Oracle Database Installation Guide for Linux Itanium*.

5 Other Known Issues

The following sections contain information about issues related to Oracle Database 10g and associated products:

- [Building Pro*C Applications if PostgreSQL is Installed](#)
- [Encoding Information Not Present in Translated Help Files](#)
- [Oracle Clusterware Files Issues](#)
- [Link Error During genorasdksh on Red Hat Enterprise Linux 4](#)
- [Cluster Verification Utility](#)
- [VLM Window Size on Red Hat Enterprise Linux](#)
- [Oracle C++ Call Interface Compiler Support](#)
- [Oracle XML Developer's Kit Compiler Support](#)
- [Removing Metrics for Wait Classes Removes Them Permanently](#)
- [SRVCTL and VIPCA Utilities Set the LD_ASSUME_KERNEL Parameter](#)
- [Error While Loading Shared Library When SELinux is Enabled on Red Hat Enterprise Linux 5](#)
- [Linking Applications with Oracle Database Client Libraries](#)
- [MAX_IDLE_BLOCKER_TIME Does Not Work in Oracle RAC Environment](#)
- [Mapping of 127.0.0.2 to the Local Host Name](#)
- [cvuqdisk-1.0.1-1.rpm \(i386 rpm\) Does not Work as Expected](#)
- [JDK Restriction](#)
- [ONS Needs to be Started from Database Before Apache Standalone Installation](#)
- [Database Control Does not Display the Listener Details](#)
- [Vendor Clusterware Restrictions for Node Names](#)

5.1 Building Pro*C Applications if PostgreSQL is Installed

If the `postgresql-devel` package is installed on the system, then you must add the following directory to the beginning of the `sys_include` parameter in the `$ORACLE_HOME/precomp/admin/pcscfg.cfg` file before building Pro*C applications:

```
$ORACLE_HOME/precomp/public
```

If you do not make this change, then you may encounter errors similar to the following when linking the applications:

```
/tmp/ccbXd7v6.o(.text+0xc0): In function `drop_tables':  
: undefined reference to `sqlca'
```

This issue is tracked with Oracle bug 3933309.

This issue is fixed with the 10.2.0.5 patch set.

5.2 Encoding Information Not Present in Translated Help Files

If the system uses a European language, you might see corrupted characters in Table of Contents of database tools, such as Database Configuration Assistant.

This issue is tracked with Oracle bug 3957096.

Workaround: If the system uses a European language, do not use the `.UTF-8` locale. For example, if the system uses German, set the `LANG` and `LC_ALL` environment variables to `de_DE` instead of `de_DE.UTF-8`.

5.3 Oracle Clusterware Files Issues

The following note applies if you are using Red Hat Enterprise Linux 4, Red Hat Enterprise Linux 5, or SUSE Linux Enterprise Server 10 and using raw devices to store the Oracle Cluster Registry (OCR) and the voting disk for Oracle Clusterware, or using raw devices for Automatic Storage Management (ASM) database files. For each raw device used for the purposes listed, you must add two entries in the `/etc/rc.d/rc.local` file on Red Hat Enterprise Linux 4, and Red Hat Enterprise Linux 5, or the `/etc/init.d/after.local` file on SUSE Linux Enterprise Server 10 after running the `root.sh` script following the installation of Oracle Clusterware.

For each OCR file, the entries should look as follows, where `oinstall` is the Oracle install group and `/dev/raw/rawn` is an individual device file:

```
chown root:oinstall /dev/raw/rawn
chmod 660 /dev/raw/rawmar
```

For each voting disk file, the entries should look as follows, where `oracle` is the Oracle user, `oinstall` is the Oracle install group, and `/dev/raw/rawn` is an individual device file:

```
chown oracle:oinstall /dev/raw/rawn
chmod 644 /dev/raw/rawmar
```

For each ASM file, the entries should look as follows, where `oracle` is the Oracle user, `oinstall` is the Oracle install group, and `/dev/raw/rawn` is an individual device file:

```
chown oracle:oinstall /dev/raw/rawn
chmod 660 /dev/raw/rawmar
```

5.4 Link Error During `genorasdksh` on Red Hat Enterprise Linux 4

Installing Oracle Database 10g Release 2 (10.2.0.1) on Red Hat Enterprise Linux 4 Update 1 (2.6.9-11.ELsmp) produces a link error during creation of `liborasdkbase.so.10.2`. The following error message is displayed:

```
INFO: gcc:
INFO: /usr/lib/libstdc++.so.5: No such file or directory
INFO:
INFO: $OH/bin/genorasdksh: Failed to link liborasdkbase.so.10.2
```

This is because Oracle Database 10g Release 2 (10.2) requires Red Hat Enterprise Linux 3 libraries (`/usr/lib/libstdc++.so.5`).

Workaround: Install the compatible libraries as follows:

```
rpm -q1 compat-libstdc++-33-3.2.3-47.3
```

This issue is tracked with Oracle bug 4605635.

5.5 Cluster Verification Utility

This section lists the issues with Cluster Verification Utility on Red Hat Enterprise Linux 4, Red Hat Enterprise Linux 5, SUSE Linux Enterprise Server 9, and SUSE Linux Enterprise Server 10:

- Cluster Verification Utility (CVU) does not support shared checks for raw disks used for Oracle Cluster File System version 2 on Red Hat Enterprise Linux 4, Red Hat Enterprise Linux 5, SUSE Linux Enterprise Server 9, and SUSE Linux Enterprise Server 10.
- The preinstallation stage verification checks for Oracle Clusterware and Oracle Real Applications Clusters and reports missing packages. Ignore the following missing packages and continue with the installation:

```
compat-gcc-7.3-2.96.128
compat-gcc-c++-7.3-2.96.128
compat-libstdc++-7.3-2.96.128
compat-libstdc++-devel-7.3-2.96.128
```

5.6 VLM Window Size on Red Hat Enterprise Linux

To use hugepages or to accommodate the VLM window size on Red Hat Enterprise Linux 4, or Red Hat Enterprise Linux 5, you must increase the default maximum size of the per-process locked memory. To increase the per-process max locked memory limit, add the following lines to the `/etc/security/limits.conf` file, where `oracle` is the user that administers the database:

```
oracle soft memlock 3145728
oracle hard memlock 3145728
```

5.7 Oracle C++ Call Interface Compiler Support

The current GNU C++ compiler version that OCCI supports with Red Hat Enterprise Linux 4.0 is GCC 3.2.3.

Workaround: Install Red Hat Enterprise Linux 4 with GCC 3.2.3.

Note: For updates on GCC support, refer to the OCCI home page on OTN:

<http://www.oracle.com/technetwork/database/features/oci/index-090820.html>

5.8 Oracle XML Developer's Kit Compiler Support

On Red Hat Enterprise Linux 4, Oracle XML Developer's Kit (XDK) is not supported with GCC. XDK is supported with Intel C++ compiler (ICC).

5.9 Removing Metrics for Wait Classes Removes Them Permanently

Do not remove the key values for the wait class metrics. Doing so removes them permanently and currently there is no easy way to recover them.

This issue is tracked with Oracle bug 4602952.

5.10 SRVCTL and VIPCA Utilities Set the LD_ASSUME_KERNEL Parameter

The SRVCTL and VIPCA utilities set the environmental variable LD_ASSUME_KERNEL. Setting this parameter on SUSE Linux Enterprise Server 10 causes the SRVCTL and VIPCA utilities to exit with the following error:

```
/opt/oracle/crs/jdk/jre/bin/java:
error while loading shared libraries:
libpthread.so.0: cannot open shared object file:
No such file or directory
```

Workaround: Remove the LD_ASSUME_KERNEL variable from the VIPCA and SRVCTL utilities. For the VIPCA utility, alter the \$CRS_HOME/bin/vipca script on all nodes to remove LD_ASSUME_KERNEL. After the "if" statement in line 123, add an unset command to ensure LD_ASSUME_KERNEL is not set as follows:

```
        if [ "$arch" = "i686" -o "$arch" = "ia64" -o "$arch" = "x86_64" ]
#         then
#             LD_ASSUME_KERNEL=2.4.19
#             export LD_ASSUME_KERNEL
#         fi
        unset LD_ASSUME_KERNEL
```

With the newly inserted line, root.sh should be able to call VIPCA successfully.

For the SRVCTL utility, alter the \$CRS_HOME/bin/srvctl scripts on all nodes by adding a line, unset LD_ASSUME_KERNEL, after line 174 as follows:

```
LD_ASSUME_KERNEL=2.4.19
export LD_ASSUME_KERNEL
unset LD_ASSUME_KERNEL
```

Oracle recommends explicitly removing LD_ASSUME_KERNEL and not commenting it out to handle cases where LD_ASSUME_KERNEL might be set in the environment (login shell).

These files must also be altered after applying the 10.2.0.2 or 10.2.0.3 patch sets, as these patch sets still include those unnecessary LD_ASSUME_KERNEL settings for Red Hat Enterprise Linux 5 or SUSE Linux Enterprise Server 10. This issue is fixed in the 10.2.0.4 patch sets.

5.11 Error While Loading Shared Library When SELinux is Enabled on Red Hat Enterprise Linux 5

SQL*Plus and Oracle Call Interface (OCI) program calls fail when selinux is in Enforcing mode on Red Hat Enterprise Linux 5.

Workaround: Shift selinux to Permissive mode on the system.

This issue is tracked with Oracle bug 6079461.

5.12 Linking Applications with Oracle Database Client Libraries

The use of the client static library is not supported.

5.13 MAX_IDLE_BLOCKER_TIME Does Not Work in Oracle RAC Environment

Setting a value for MAX_IDLE_BLOCKER_TIME feature of Resource manager does not work as expected in Oracle RAC environment.

Workaround: Set a value for `MAX_IDLE_TIME` instead of setting a value for `MAX_IDLE_BLOCKER_TIME`.

This issue is tracked with Oracle bug 6114355.

5.14 Mapping of 127.0.0.2 to the Local Host Name

By default, the host name of a computer is mapped to the IP address 127.0.0.2 through an entry in the `/etc/hosts` similar to the following on SUSE Linux Enterprise Server 10:

```
127.0.0.2      test test.example.com
```

YaST does this to provide compatibility with earlier versions of the applications that had problems running on desktops with dynamically assigned host names from DHCP. This mapping may cause certain Oracle networking libraries to encounter errors when they attempt to resolve the host name of the computer. To avoid these problems, the entry should be removed from the `/etc/hosts` file. Note that several network related YaST utilities may add this entry back to the file.

The host name must be included in the `/etc/hosts` file. If you do not include the host name in this file, then the following error is displayed:

```
ORA-00600: internal error code, arguments:  
[keltnfy-ldmInit], [46], [1], [], [], [], [], []
```

5.15 cvuqdisk-1.0.1-1.rpm (i386 rpm) Does not Work as Expected

`cvuqdisk-1.0.1-1.rpm` (i386 rpm) does not work as expected in Linux Itanium. You must install `cvuqdisk-1.0.1-1.ia64.rpm` for cluster verification utility to verify the sharedness check of raw disks for 10.2 Linux Itanium.

5.16 JDK Restriction

When you use Oracle Universal Installer or Database Configuration Assistant in Japanese environment, you must set the `LANG` environment variable to `C`.

This issue is tracked with Oracle bug 4764895.

5.17 ONS Needs to be Started from Database Before Apache Standalone Installation

If you plan to install Oracle HTML DB with Oracle HTTP Server from companion CD on the system where Oracle Database 10g has been installed, you must start ONS before you start the companion CD installation. This is required to prevent the companion CD installation from allocating the ports allocated to ONS Server in the Database installation.

This issue is tracked with Oracle bug 4701821.

5.18 Database Control Does not Display the Listener Details

When you connect to the database using Database Control, the page does not display the listener details.

Workaround: After installing Oracle Database 10g Release 2, you must shut down the Database Control with the `emctl stop dbconsole` command. Modify the `targets.xml`

file located in `$ORACLE_HOME/hostname_SID/sysman/emd` directory so that the value of the `machinename` field is the same for listener and database. Restart Database Control with the command `emctl start. dbconsole` to display the listener details.

This issue is tracked with Oracle bug 6743916.

5.19 Vendor Clusterware Restrictions for Node Names

If you use a vendor clusterware with Oracle Clusterware and Oracle Real Application Clusters, then you must use the node names and host names registered with that vendor clusterware you have installed. Refer to the Certifications page on My Oracle Support (formerly *OracleMetaLink*) (<https://support.oracle.com>) for information about vendor clusterware supported for your Linux distribution.

6 Documentation Corrections and Additions

This section lists the following corrections to installation guides for Linux Itanium.

- [Incorrect Kernel Parameter Values](#)
- [Incorrect Shell Limit Setting](#)
- [List of Packages for Red Hat Enterprise Linux 5](#)
- [List of Packages for SUSE Linux Enterprise Server 10](#)
- [List of Packages for SUSE Linux Enterprise Server 11](#)
- [Kernel Version Requirements](#)
- [Incorrect Oracle Clusterware Home Example](#)
- [Oracle Clusterware and Oracle RAC Virtual IP Address Status](#)
- [Incorrect Value for MAXINSTANCES](#)
- [Oracle RAC and the Hangcheck_reboot Parameter on Linux 2.6 Kernels](#)
- [Configuring Oracle Clusterware Process Monitor Daemon](#)
- [DB_BLOCK_SIZE Initialization Parameter Update](#)
- [Oracle Inventory Group Name](#)
- [Incorrect /etc/profile Reference](#)
- [Incorrect Control File Size Limits](#)
- [Incorrect Information About JPublisher and Oracle SQLJ Installation](#)

6.1 Incorrect Kernel Parameter Values

In *Oracle Database Installation Guide for Linux Itanium*, Chapter 2, section "Configuring Kernel Parameters", and in *Oracle Database Quick Installation Guide for Linux Itanium*, section "Configuring Kernel Parameters," update or add the following to the existing list of Kernel Parameters:

Parameter	Minimum Value	File
<code>rmem_default</code>	262144	<code>/proc/sys/net/core/rmem_default</code>
<code>rmem_max</code>	2097152	<code>/proc/sys/net/core/rmem_max</code>

Parameter	Minimum Value	File
wmem_max	1048576	/proc/sys/net/core/wmem_max
ip_local_port_range	Minimum: 9000 Maximum: 65500 Note: Ignore any Oracle Universal Installer warnings related to this parameter.	/proc/sys/net/ipv4/ip_local_port_range
aio-max-nr	Maximum: 1048576 Note: This value limits concurrent outstanding requests and should be set to avoid I/O subsystem failures.	/sbin/sysctl
file-max	327679 Note: If you have multiple databases on the same system or if you plan to consolidate multiple databases, then Oracle recommends using a higher value.	/proc/sys/fs/file-max

6.2 Incorrect Shell Limit Setting

In *Oracle Database Installation Guide for Linux Itanium*, Chapter 2, section "Setting Shell Limits for the oracle User", the values and the process to increase the shell limits is incorrect.

Update the following in the "Setting Shell Limits for the oracle User" section:

Add the following lines in the `/etc/security/limits.conf` file:

```
oracle soft nproc 16384
oracle hard nproc 16384
oracle soft nofile 65536
oracle hard nofile 65536
```

Add or edit the following line in the `/etc/pam.d/login` file, if it does not exist:

```
session required pam_limits.so
```

After you set the hard and soft values in the `/etc/security/limits.conf` file, you do not have to modify the `/etc/profile` file.

6.3 List of Packages for Red Hat Enterprise Linux 5

The following packages (or later versions) must be installed:

```
binutils-2.17.50.0.6-2.e15
compat-libstdc++-33-3.2.3-61
elfutils-libelf-0.125-3.e15
elfutils-libelf-devel-0.125-3.e15
gcc-4.1.1-52.e15
gcc-c++-4.1.1-52.e15
glibc-2.5-12
glibc-common-2.5-12
```

```
glibc-devel-2.5-12
glibc-headers-2.5-12
libaio-0.3.106-3.2
libaio-devel-0.3.106-3.2
libgcc-4.1.1-52.e15
libstdc++4.1.1-52.e15
libstdc++-devel-4.1.1-52.e15
make-3.81-1.1
sysstat-7.0.0-3.e15
unixODBC-2.2.11-7.1
unixODBC-devel-2.2.11-7.1
```

6.4 List of Packages for SUSE Linux Enterprise Server 10

The following packages (or later versions) must be installed:

```
binutils-2.16.91.0.5
compat-libstdc++-5.0.7-22.2
gcc-4.1.0
glibc-2.4-31.63
glibc-devel-2.4-31.63
ksh-93r-12.9
libaio-0.3.104-14.2
libaio-devel-0.3.104-14.2
libelf-0.8.5-47.2
libgcc-4.1.0-28.4
libstdc++-4.1.0-28.4
libstdc++-devel-4.1.0-28.4
make-3.80-202.2
sysstat-6.0.2-16.4
unixODBC-2.2.11-21.4
unixODBC-devel-2.2.11-21.4
```

6.5 List of Packages for SUSE Linux Enterprise Server 11

The following packages (or later versions) must be installed:

```
binutils-2.19.11.28
gcc-4.3-62.198
glibc-2.9-13.2
glibc-devel-2.9-13.2
ksh
libaio-0.3.104-140.22
libaio-devel-0.3.104-140.22
libgcc-43-4.3.3-11.18
libstdc++-4.3.3-11.18
libstdc++-devel-4.3.3-11.18
make-3.81
sysstat-8.1.5-7.8
```

6.6 Kernel Version Requirements

The system must be running the following kernel version (or a later version):

- **Red Hat Enterprise Linux 5.0**

2.6.18-53.EL

- **SUSE Linux Enterprise Server 10**

2.6.16-21

- **SUSE Linux Enterprise Server 11**

2.6.27.19

6.7 Incorrect Oracle Clusterware Home Example

In *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide for Linux*, Chapter 2, "Pre-Installation Tasks," section "Oracle Clusterware Home Directory," incorrectly lists the path `/u01/app/oracle/product/crs` as a possible Oracle Clusterware home path. A default Oracle base path is `/u01/app/oracle`, and the Oracle Clusterware home must never be a subdirectory of the Oracle base directory.

A possible Oracle Clusterware home directory is in a path outside of the Oracle base directory. For example, if the Oracle base directory is `u01/app/oracle`, then the Oracle Clusterware home can be an option similar to one of the following:

```
u01/crs/  
/u01/crs/oracle/product/10/crs  
/crs/home
```

6.8 Oracle Clusterware and Oracle RAC Virtual IP Address Status

In *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide for Linux*, Chapter 2, "Pre-Installation Tasks," section 2.6.1, "IP Address Requirements," the following text states that the virtual IP address (VIP) should respond to a `ping` command:

During installation, OUI uses the `ping` command to ensure that the VIP is reachable.

The preceding statement is incorrect. Before installation, the VIP address should be configured in DHCP or `/etc/hosts`, or both, but it must not be assigned to a server that can respond to a `ping` command.

6.9 Incorrect Value for MAXINSTANCES

In *Oracle Database Administrator's Reference for UNIX-Based Operating Systems*, Appendix H, "Database Limits," states the incorrect maximum value (63) for the `MAXINSTANCES` variable. The correct maximum limit for the variable is 1055.

6.10 Oracle RAC and the Hangcheck_reboot Parameter on Linux 2.6 Kernels

In *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide for Linux*, Chapter 2, "Pre-Installation Tasks", Section 2.16, "Checking the Configuration of the Hangcheck-timer Module", as initially released, information about the `hangcheck_reboot` parameter is missing.

The `hangcheck_reboot` parameter indicates to the `hangcheck-timer` whether it should restart the node. The `hangcheck-timer` restarts the node if the kernel fails to respond within the time determined by the sum of the `hangcheck_tick` and `hangcheck_margin` parameter values, and the `hangcheck_tick` parameter value is greater than or equal to

1. If the `hangcheck_reboot` parameter is set to zero (0), then the `hangcheck-timer` does not restart the node.

By default, on 2.4 Linux kernels, the value of `hangcheck_reboot` is 1. However, on 2.6 kernels, the default value is 0. In an Oracle RAC environment, you must set the `hangcheck_reboot` parameter to 1.

Set `hangcheck_reboot=1` while loading the `hangcheck-timer` module. If you find that the cluster produces false node evictions, then increase the `hangcheck_margin` parameter value, and retest the cluster.

6.11 Configuring Oracle Clusterware Process Monitor Daemon

The 10.2.0.4 patch release for Oracle Clusterware on Linux includes the Oracle Clusterware Process Monitor Daemon (`oproc`). It is started automatically by Oracle Clusterware to detect system hangs. When it detects a system hang, it restarts the hung node.

Review the following configuration information if you have installed the 10.2.0.4 patch set.

Oracle has found wide variations in scheduling latencies observed across operating systems and versions of operating systems. Because of these scheduling latencies, the default values for `oproc` can be overly sensitive, particularly under heavy system load, resulting in unnecessary `oproc`-initiated restarts (false restarts).

Oracle recommends that you address scheduling latencies with your operating system vendor to reduce or eliminate them as much as possible, as they can cause other problems.

To overcome these scheduling latencies, Oracle recommends that you set the Oracle Clusterware parameter `diagwait` to the value 13. This setting increases the time for failed nodes to flush final trace files, which helps to debug the cause of a node failure. You must shut down the cluster to change the `diagwait` setting. However, if you prefer, you can use the default timing threshold for `diagwait`. In that case, do not perform the procedure documented here.

If you require more aggressive failover times to meet more stringent service level requirements, then you should open a service request with Oracle Support to receive advice about how to tune for lower failover settings.

Note: Changing the `diagwait` parameter requires a clusterwide shutdown. Oracle recommends that you change the `diagwait` setting either immediately after the initial installation, or during a scheduled outage.

See Also: *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Administration and Deployment Guide* for more information

To change the `diagwait` setting:

1. Log in as `root`, and run the following command on all nodes, where `CRS_home` is the home directory of the Oracle Clusterware installation:

```
# CRS_home/bin/crsctl stop crs
```


2. Enter the following command, where *CRS_home* is the Oracle Clusterware home:

```
# CRS_home/bin/oproc d stop
```

Repeat this command on all nodes.

3. From one node of the cluster, change the value of the *diagwait* parameter to 13 seconds by issuing the following command as *root*:

```
# CRS_home/bin/crsctl set css diagwait 13 -force
```

4. Restart the Oracle Clusterware by running the following command on all nodes:

```
# CRS_home/bin/crsctl start crs
```

5. Run the following command to ensure that Oracle Clusterware is functioning properly:

```
# CRS_home/bin/crsctl check crs
```

6.12 DB_BLOCK_SIZE Initialization Parameter Update

In *Oracle Database Administrator's Reference for UNIX-Based Operating Systems*, chapter 1, section "DB_BLOCK_SIZE Initialization Parameter", lists the incorrect value of DB_BLOCK_SIZE parameter. The maximum value to which you can set the DB_BLOCK_SIZE is 16 KB on Linux x86. It is 32 KB on all other UNIX platforms.

6.13 Oracle Inventory Group Name

In Oracle Database documentation, Oracle inventory group is represented as *oinstall*. However, it is not mandatory to use the same name, you can enter a different name for the group.

6.14 Incorrect /etc/profile Reference

In *Oracle Database Installation Guide for Linux Itanium*, under Section 2.6, "Configure Kernel Parameters", subsection "Setting Shell Limits for the oracle User", the third list item has an incorrect reference to the */etc/profile* file. Ignore the entire third list item as making changes in the */etc/profile* file is not required.

6.15 Incorrect Control File Size Limits

In *Oracle Database Administrator's Reference for UNIX-Based Operating Systems Guide*, Appendix H, "Database Limits", Table H-2, "File Size Limits", states incorrect value of 20000 database blocks as control file size. The correct value is 25000 control file blocks with a block size of 4096 bytes.

6.16 Incorrect Information About JPublisher and Oracle SQLJ Installation

- In *Oracle Database Vault Installation Guide for Linux Itanium*, Chapter 4, section, "Installing Oracle Database 10g Products from the Companion CD," erroneously states that JPublisher and Oracle SQLJ are installed. The correct information is that JPublisher is not a part of Companion CD and Oracle SQLJ Demos are installed with the Companion CD instead of Oracle SQLJ.
- In *Oracle Database Companion CD Installation Guide for Linux Itanium*, Chapter 1, section, "Products Available in the Oracle Database 10g Products Installation

Type," erroneously states that JPublisher and Oracle SQLJ are installed. The correct information is that JPublisher is not a part of Companion CD and Oracle SQLJ Demos are installed with the Companion CD instead of Oracle SQLJ.

Note: The SQLJ Demos are installed if Oracle SQLJ was installed before running the Companion CD installation.

7 Documentation Accessibility

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