Oracle9*i*

Release Notes

Release 1 (9.0.1) for Linux Intel

June 2001

Part No. A90356-01

These release notes contain system requirements, kernel parameters, and last-minute information not included in the Oracle9*i* documentation library on the Online Documentation CD-ROM.

This document contains the following topics:

Requirements

The requirements in these release notes are current as of the release date for Oracle9*i*. For the most current information, refer to the online release notes, which are located at the following site:

http://docs.oracle.com

If you need assistance with navigating the Oracle Documentation site, refer to the following site:

http://docs.oracle.com/instructions.html

The following requirements must be met to perform a typical Oracle9*i* software installation.

- Memory: A minimum of 512 MB of is required to install Oracle9*i* Server. A minimum of 512 MB is required to install Oracle9*i* Management and Integration. A minimum of 128 MB is required to install Oracle9*i* Client. Use the following command to verify the amount of memory installed on your system:

  ```
  $ grep MemTotal /proc/meminfo
  ```

- Swap Space: An amount of disk space equal to twice the amount of RAM or at least 512 MB, whichever is greater. Use the following command to determine the amount of swap space installed on your system:

  ```
  $ /sbin/swapon -s
  ```

- Processor: The following processors are recommended for Oracle9*i* database installation:

Installation Type	Recommended Processor	Minimal Processor
Enterprise Edition	Pentium III Xeon 550 MHz or greater	Pentium II 233 MHz
Standard Edition	Pentium II 233 MHz	Pentium II 233 MHz

- CD-ROM: A CD-ROM drive capable of reading CD-ROM disks in the ISO 9660 format with RockRidge extensions.
- Disk Space: 2.5 GB for database software, and an additional 1 GB for a seed database.
- Temporary Disk Space: The Oracle Universal Installer requires up to 400 MB of space in the `/tmp` directory.

Note: If there is not 400 MB of available space in the `/tmp` directory, then you can set the TMP or TMPDIR environment variable to point to a directory that has at least 400 MB of available space. This directory must be writable by the user account performing the installation.

- Operating System: Oracle9*i* is certified on SuSe 7.1, Kernel 2.4.4, and the operating system library GNU Lib C 2.2.
- JRE: Oracle9*i* components require Blackdown JDK/JRE 1.1.8_v3, except for BC4J, UltraSearch, and JDBC 1.2 drivers, which all require Sun JDK/JRE 1.3.1.
- JDK: Oracle HTTP Server Powered by Apache uses Sun JDK 1.3.1 or Blackdown JDK 1.1.8_v3. Respective JDK version installation is a pre-requisite for Oracle HTTP Server Powered by Apache. The JDK installation location will be prompted during the Oracle9*i* installation. Only the classic JVM is supported with Sun JDK 1.3.1. Modify the `$ORACLE_HOME/Apache/JServ/etc/jserv.properties` file to include the following entries in the Execution Parameters section. Enter the entries in the following order:

  ```
  wrapper.bun.parameters=-classic
  wrapper.bun.parameters=-Xms64m # optional
  wrapper.bun.parameters=-Xmx128m # optional
  ```

  See Also: For more information, refer to *HTTP Server README* on the Online Documentation CD-ROM.

  Note: Sun's JDK 1.3.1 is available from the following address:

  `http://java.sun.com`

  Blackdown's JDK 1.1.8_v3 is available from the following address:

  `http://www.blackdown.org`

- Operating System Software Requirements: The following table lists the operating system software requirements:

OS Software	Requirements
Operating System Packages	SuSE 7.1, with Kernel 2.4.4, make-3.79, and binutils-2.10.

OS Software	Requirements
Window Manager	Use any X Server supported by your UNIX operating system vendor. For Hummingbird Exceed, use native window manager. To determine if your X windows system is working properly on your local system, enter the following command: `$ xclock`
Required Executables	The following executables must be present in the `/usr/bin` directory: `make`, `ar`, `ld`, `nm`.

Kernel Parameters

Oracle9*i* uses UNIX resources such as shared memory, swap space, and semaphores extensively for interprocess communication. If your kernel parameter settings are insufficient for Oracle9*i*, you will experience problems during installation and instance startup. The greater the amount of data you can store in memory, the faster your database will operate. In addition, by maintaining data in memory, the UNIX kernel reduces disk I/O activity.

Use the `ipcs` command to obtain a list of the system's current shared memory and semaphore segments, and their identification number and owner.

You can modify the kernel parameters by using the `/proc` file system.

To modify kernel parameters using the /proc file system:

1. Log in as `root` user.
2. Change to the `/proc/sys/kernel` directory.
3. Review the current semaphore parameter values in the `sem` file using the `cat` or `more` utility. For example,

   ```
   # cat sem
   ```

   The output will list, in order, the values for the SEMMSL, SEMMNS, SEMOPM, and SEMMNI parameters. The following example shows how the output will appear.

   ```
   250 32000 32 128
   ```

   In the preceding example, 250 is the value of the SEMMSL parameter, 32000 is the value of the SEMMNS parameter, 32 is the value of the SEMOPM parameter, and 128 is the value of the SEMMNI parameter.
4. Modify the parameter values using the following command:

```
# echo SEMMSL_value SEMMNS_value SEMOPM_value SEMMNI_value > sem
```

In the preceding command, all parameters must be entered in order.

5. Review the current shared memory parameters using the `cat` or `more` utility. For example,

```
# cat shared_memory_parameter
```

In the preceding example, the *shared_memory_parameter* is either the SHMMAX or SHMMNI parameter. The parameter name must be entered in lowercase letters.

6. Modify the shared memory parameter using the `echo` utility. For example, to modify the SHMMAX parameter, enter the following:

```
# echo 2147483648 > shmmax
```

7. Write a script to initialize these values during system startup and include the script in your system `init` files.

> **See Also:** For more information on script files and `init` files, refer to your system vendor's documentation.

Refer to the following table to determine if your system shared memory and semaphore kernel parameters are set high enough for Oracle9*i*. The parameters in the following table are the minimum values required to run Oracle9*i* with a single database instance.

Kernel Parameter	Setting	Purpose
SEMMNI	100	Defines the maximum number of semaphore sets in the entire system.
SEMMNS	256	Defines the maximum semaphores on the system. This setting is a minimum recommended value, for initial installation only. The SEMMNS parameter should be set to the sum of the PROCESSES parameter for each Oracle database, adding the largest one twice, and then adding an additional 10 for each database.
SEMMSL	100	Defines the maximum number of semaphores for each user id. The SEMMSL setting should be 10 plus the largest PROCESSES parameter of any Oracle database on the system.
SEMOPM	100	Defines the maximum number of operations per `semop` call.
SEMVMX	32767	Defines the maximum value of a semaphore.

Kernel Parameter	Setting	Purpose
SHMMAX	2147483648	Defines the maximum allowable size of the shared memory. The SHMMAX parameter does not affect how much shared memory is used or needed by Oracle9*i*, the operating system, or the operating system kernel. One-half the size of your system's physical memory. Check your system for additional restrictions.
SHMMIN	1	Defines the minimum allowable size of a single shared memory segment.
SHMMNI	100	Defines the maximum number of shared memory segments in the entire system.
SHMSEG	4096	Defines the maximum number of shared memory segments one process can attach.

Note: These are minimum kernel requirements for Oracle9*i*. If you have previously tuned your kernel parameters to levels equal to or higher than these values, continue to use the higher values. A system restart is necessary for kernel changes to take effect.

Documentation

Additional product `README` files are located in their respective product directories under the `$ORACLE_HOME` directory and in the `$ORACLE_HOME/relnotes` directory.

Installation Issues

This section contains these topics:

- Multiple CD-ROM Installation
- runInstaller Script
- Oracle Universal Installer
- Installation with Response Files
- Oracle Internet Directory Installation

Multiple CD-ROM Installation

During installation of Oracle9*i* release 9.0.1, you will be prompted to insert additional CD-ROMs from the set that make up Oracle9*i* release 9.0.1. After inserting the requested disk, change the path in the *Disk Location* dialog to reflect the root directory of the newly mounted CD-ROM.

For example, when you insert Disk 3 with a directory path of `/cdrom`, change the path in the *Disk Location* dialog to `/cdrom`.

runInstaller Script

In an X window environment, it is possible to launch Oracle Universal Installer by running the `runInstaller` script from a shell or by selecting the script in the *File Manager* window. Oracle Corporation recommends that you do not launch the script by selecting the script from the *File Manager* window since you will not be able to eject a software CD-ROM until you end the installation session. The Oracle9*i* installation uses multiple CD-ROMs, and it is necessary to insert and eject more than one CD-ROM.

Oracle Universal Installer

The following error message can be ignored during the upgrade of the database from release 8.1.*x* to release 9.0.1:

```
ORA-00604: error occurred at recursive SQL level 1
```

Installation with Response Files

For installation with a response file, the path to the response file must be the full path on the machine. The Oracle Universal Installer will not properly handle relative paths.

Oracle Internet Directory Installation

After the installation of the Oracle Internet Directory, run the `postcfg` script from the command line to run the OID post-installation configuration steps:

```
$ORACLE_HOME/ldap/postcfg/postcfg
```

Product-Related Issues

This section contains these topics:

Oracle Internet Directory

The following sections contain Oracle Internet Directory issues.

Upgrade from Oracle8*i* release 8.1.7 Enterprise Edition If you are upgrading from an Oracle8*i* release 8.1.7 Enterprise Edition with Oracle Internet Directory, then you must first upgrade Oracle Internet Directory to release 3.0.1 before upgrading to Oracle9*i* release 9.0.1 Enterprise Edition.

Upgrade from Previous Release of Oracle Internet Directory Oracle9*i* release 9.0.1 supports upgrades for releases of Oracle Internet Directory release 2.1.1.x.0 to Oracle Internet Directory release 3.0.1.

Password Management When performing an Oracle Internet Directory installation the Database Configuration Assistant opens an alert window, and shows the passwords for the SYS and SYSTEM database roles. Do not change these passwords. Click OK.

Global Database Name and Oracle SID When performing a custom Oracle Internet Directory installation, do not change the global database name or the Oracle SID.

> **See Also:** For more information on Oracle Internet Directory utilities, and necessary pre-upgrade and post-upgrade tasks, refer to *Oracle Internet Directory README*.

Oracle Database Configuration Assistant

When you use Oracle Database Configuration Assistant to create a custom database that includes Oracle JServer, it can take over an hour to load Oracle JServer into the database. The amount of time depends on your system's hardware configuration.

Oracle OLAP Services

Oracle9*i* OLAP Services will be available on this platform in a future release.

Oracle Real Application Clusters

Oracle Real Application Clusters on Linux provides the same user functionality found on Windows NT and UNIX platforms with the following differences:

Oracle Cluster Management Software (OCMS) Oracle Corporation developed and deployed a complete clusterware layer called OCMS to enable Oracle Real Application Clusters on Linux. OCMS is unique to the Linux version of Oracle Real Application Clusters and includes Watchdog Daemon, Node Monitor, and Cluster Manager. OCMS sits on top of the operating system and provides all the clustering services that Oracle Real Application Clusters needs to function as a high availability and scalability solution.

Product Deployment OCMS is bundled with Oracle Real Application Clusters and is installed automatically when you install Oracle Real Application Clusters.

Unlike the Oracle Real Application Clusters versions on Windows NT and UNIX platforms, you no longer rely on the system vendor to provide the clusterware layer (the operating system dependent modules or the equivalents). Oracle Corporation provides all the software needed above the operating system, and system vendors provide the complete hardware cluster and, in some cases, with the operating system pre-installed.

Cluster Certification - What Hardware to Use Oracle Corporation only supports Oracle Real Application Clusters on certified cluster configurations. These certified configurations are available for purchase from Oracle Corporation partners participating in the Oracle Real Application Clusters certification program. Certifications are performed on a continuous basis and are added to the list of supported platforms.

> **See Also:** For information on the latest certifications completed and for cluster platform availability, go to the following site and follow the Oracle Real Application Cluster links:
>
> `http://www.oracle.com`

The certifications focus on the operating system and the hardware (servers, shared disk subsystem, interconnect technology, and I/O technology). Several versions of the Linux operating system have been tested with Oracle Real Application Clusters. However these versions are considered certified only as part of a complete certified cluster configuration supported by a system vendor.

Oracle Real Application Clusters requires a configuration certified by Oracle Corporation. All certified configurations require the following:

- Two or more 32-bit Intel servers (called nodes)
- A separate and dedicated intra-cluster network among the nodes with Network Interface Cards (NICs) that support TCP/IP. If the cluster has more than two nodes, then a switch or hub in the intra-cluster network might be necessary.

- An external shared SCSI disk array or external Fiber Channel disk array with shared disk partitions, where the shared disk array has the following minimum configuration:
  - At least one partition for each data file (system tablespace)
  - Two partitions for each node, for redo log threads
  - One partition for the node monitor, whose size is:

    4 + [(the number of nodes in the cluster) * 4] KB
  - Two or more partitions for the control file

The following are the Oracle Real Applications Clusters shared disk requirements:

- All nodes must be cabled to access shared disks. For example, either of the following is acceptable:
  - A daisy-chain connection of SCSI host adaptors or fiber-channel host adaptors, and shared disks
  - A one-to-one connection of SCSI host adaptors or fiber-channel host adaptors, and shared disks. This requires a multi-port disk.

Note: Oracle Corporation does not support Oracle Real Applications Clusters on hardware configurations that are not certified.

Linux LVM is supported for use with Oracle Real Application Clusters.

Installing Oracle Real Application Clusters for Linux

Perform the following steps to install Oracle Real Application Clusters:

1. Start the Oracle Universal Installer from node1 as described in "Oracle Universal Installer" in the *Oracle9i Installation Guide Release 1 (9.0.1) for UNIX Systems*.
2. In the *Welcome* window, click Next to begin your installation.
3. In the *File Locations* window, enter the Oracle home directory path in the *Destination* field.
4. In the *Available Products* window, select the Oracle9*i* Database installation category.
5. In the *Installation Types* window, select Custom. Oracle Real Application Clusters is not supported on Enterprise Edition and Standard Edition installations.

6. In the *Available Products* window, select Oracle Real Application Clusters 9.0.1. If you do not select this option, Oracle Real Application Clusters will not be installed.

7. In the *Cluster Node Selection* window, enter names of the remote nodes on which you want to install Oracle Real Application Clusters. Enter the node names. Do not enter the domain names. Oracle Real Application Clusters Installation supports up the eight nodes. The local node is selected by default and you do not need to enter it.

8. After the installation is complete, start the OCMS on all the nodes you specified.

   See Also: For more information on how to start and configure OCMS, refer to *Oracle9i Administrator's Reference Release 1 (9.0.1) for UNIX Systems*.

9. To run the Oracle Cluster Configuration Assistant, enter the following from the command line of the server on which you started the installer:

   ```
   $ cd $ORACLE_HOME/bin
   $ ./clustca -nodeinfo \
   <node_name0>,<node_number0> <node_name1>,<node_number1>...
   ```

   In the preceding commands, <*node_name*> is the name of the node where you will install Real Application Clusters and <*node_number*> is a unique number for each node starting with 0. All nodes in the cluster need to be listed.

10. To run the Oracle Net Configuration Assistant, enter the following from the command line of the server on which you started the installer:

    ```
    $ cd $ORACLE_HOME/bin
    $ ./netca
    ```

11. To run the Oracle Database Configuration Assistant, enter the following from the command line of the server on which you started the installer:

    ```
    $ cd $ORACLE_HOME/bin
    ```

    For the Bourne or Korn shell:

    ```
    $ THREADS_FLAG=native
    $ export THREADS_FLAG
    $ ./dbca
    ```

    For the C Shell:

    ```
    $ setenv THREADS_FLAG native
    $ ./dbca
    ```

Note: The Oracle Cluster Configuration Assistant, Oracle Database Configuration Assistant, and Oracle Net Configuration Assistant do not start automatically at the end of the installation.

Only new database creation is supported with a Real Application Clusters installation.

Raw devices used for redo log files must be at least 101 MB in size.

Java Database Connectivity Driver

The default behavior for the `ResultSet::getXXXStream()` has been modified to comply with the Java Database Connectivity (JDBC) specification so that the APIs return null values for database null `LONG/LONG RAW` values.

For Oracle8*i* release 8.1.*x* JDBC drivers, the default behavior was to return an empty stream for database null values. The Java property `jdbc.backward_compatible_to_8.1.7` allows the system to use the earlier JDBC default behavior when using the Oracle9*i* drivers, and applies to Oracle9*i* JDBC Thin and OCI drivers.

For example, if the Java property is set at the virtual machine runtime, the following command will cause the Oracle9*i* JDBC drivers to return empty streams from calls to `ResultSet::getXXXStream()`:

```
java -Djdbc.backward_compatible_to_8.1.7 myJavaProgram
```

Demo Schema

If you select a multibyte character set or UTF as the national character set in Oracle9*i* release 9.0.1, then you must recreate the demo schema and database installation.

For more information on creating schemas, schema dependencies, and requirements, refer to the `readme.txt` file in the `$ORACLE_HOME/demo/schema` directory.

Character Sets

The following sections contain character sets issues.

Oracle9*i* NCHAR Datatypes In Oracle9*i* release 9.0.1, the SQL NCHAR datatypes are limited to the Unicode character set encoding (UTF8 and AL16UTF16). Alternative character sets such as the fixed-width Asian character set JA16SJISFIXED in Oralce8*i* are no longer supported.

To migrate existing NCHAR, NVARCHAR, and NCLOB columns, export and import NCHAR columns, do the following:

1. Export all SQL NCHAR columns from Oracle8*i*.
2. Drop the SQL NCHAR columns.
3. Migrate the database to Oracle9*i*.
4. Import the SQL NCHAR columns into Oracle9*i*.

AL24UTFFSS Character Set Oracle9*i* release 9.0.1 does not support the Unicode character set AL24UTFFSS introduced in Oracle7. This character set was based on the Unicode standard 1.1, which is now obsolete.

Oracle9*i* release 9.0.1 supports the Unicode database character sets AL32UTF8 and UTF8. These database character sets include the Unicode enhancements based on the Unicode standard 3.0.

To migrate the existing AL24UTFFSS database, upgrade your database character set to UTF8 before upgrading to Oracle9*i*. Oracle Corporation recommends that you use the Character Set Scanner for data analysis before attempting to migrate your existing database character set.

Character Set Scanner Set the LD_LIBRARY_PATH variable to include the `$ORACLE_HOME/lib` directory before running the Character Set Scanner (csscan) from the `$ORACLE_HOME` directory. If you do not correctly set the LD_LIBRARY_PATH variable, then the csscan utility will fail.

Oracle XML SQL Utility

Multi-byte character string arguments are not supported for Oracle XML SQL Utility. This is a limitation of the JRE on Linux.

Asynchronous I/O

Asynchronous I/O is not supported on Oracle9*i* Release 1 (9.0.1) for Linux Intel. This is a limitation of the Linux kernel. Ensure that the `init.ora` parameter, `disk_asynch_io`, is set to FALSE when using I/O slaves.

Products Not Available in Oracle9*i* Release 1 (9.0.1) for Linux Intel

The following options are not available for installation with Release 1 (9.0.1) for Linux Intel:

- Precompiler options -- Mod*Ada, Pro*FORTRAN, and Pro*COBOL
- Legato Storage Manager

Post-Installation Issues

This section contains issues that can occur during post-installation.

Relink Script Errors

The relink script is located in the `$ORACLE_HOME/bin` directory. If you run the command `relink all`, the relink script tries to relink the Oracle Names and Oracle Connection Manager executables even when these products are not installed. If you did not install Oracle Names and Oracle Connection Manager, you will see the following errors:

```
ld: fatal: File processing errors.  No output written to names
make: Fatal error:  Don't know how to make target
'<ORACLE_HOME>/network/lib/s0nfpc.o'
```

These errors should be ignored. They will not occur if Oracle Names and Oracle Connection Manager are installed.

Migration and Upgrade

This section contains migrating and upgrading issues on certified Linux distributions for the following scenarios:

- From Oracle8 release 8.0.6 or Oracle8i release 8.1.5 to Oracle9i
- From Oracle8i release 8.1.6 or 8.1.7 to Oracle9i

From Oracle8 release 8.0.6 or Oracle8*i* release 8.1.5 to Oracle9*i*

To upgrade from Oracle8 release 8.0.6 or Oracle8*i* release 8.1.5 to Oracle9*i*:

1. Export Oracle8 release 8.0.6 or Oracle8*i* release 8.1.5 schema data and objects by using the Export/Import utility.
2. Upgrade your Linux operating system to a GNU Lib C v2.2 (glibc 2.2) based system such as SuSE 7.1 (kernel 2.4.4).
3. Install Oracle9*i* for Linux.
4. Import Oracle8 release 8.0.6 or Oracle8*i* release 8.1.5 schema data and objects into Oracle9*i* by using the Export/Import utility.

From Oracle8*i* release 8.1.6 or 8.1.7 to Oracle9*i*

To upgrade from Oracle8*i* release 8.1.6 or 8.1.7 to Oracle9*i*:

1. If Oracle8*i* is not running on a GNU Lib C v2.2 based system, then upgrade your Linux distribution to a GNU Lib C v 2.2 (glibc v2.2) based system such as SuSE 7.1 (kernel 2.4.4).
2. Apply the Oracle provided GNU Lib C v2.1.3 (glibc 2.1.3.x) Stub Library patch (#1467074). This patch enables Oracle8*i* to work in the new Linux distribution.
3. Install Oracle9*i* for Linux

4. Use Oracle Data Migration Assistant to migrate Oracle8*i* release 8.1.6 or 8.1.7 schema data and objects to Oracle9*i*.