



Oracle® Provides Cost Effective Oracle8™ Scalable Technology on Linux* for Small and Medium-sized Businesses

This document describes the procedure for installing the Oracle8 databases onto an Intel® Pentium® II processor-based server or better. You perform this installation from the CD-ROM provided with your product. Refer to the release notes with the Oracle8 software to check the Linux kernel version for which your particular copy of Oracle8 is certified. This particular installation was verified with Oracle 8.0.5 on the redhat® 5.2 Linux, which is based on Linux kernel v2.0.34. Oracle 8.0.5 is certified for Linux kernel v2.0.33 or higher.

Please gather the recipes for Linux® Server and a specific recipe solution for Oracle8 from the Intel Channel website at <http://www.intel.com/go/serverbuilder>.

Data is the Most Valuable Business Asset

For any business, the most important asset is their business data. Therefore it is critically important to have reliable data management software. Features typically sought are quick and reliable information retrieval, data manipulation (such as adding or updating records), applications that understand this data and are easy to use, concurrent access by a number of users, and the ability to scale upwards along various dimensions as the business grows. The computer systems where this data is stored should not only satisfy these objectives, they should additionally work cooperatively and seamlessly as part of a network. Finally the cumulative cost of managing this data over time should fit well in the budget for managing the business.

Many businesses start out small as a home office or small business. Accordingly their computing requirements as well as their IT budget is low. They usually deploy commodity hardware and packaged applications. At the other end of the spectrum are large enterprises with diverse computing environments operating in a network of heterogeneous systems often with custom built or homegrown applications. However in both cases, the fundamental requirements for data management are the same.

There are basically two categories of applications that are run against any database - OLTP or On-Line Transaction Processing, and DSS or Decision Support Systems. OLTP applications have multiple user

sessions conducting database transactions usually at the same time. DSS applications on the other hand are resource intensive although, often, there are few users. Both types of applications can be deployed over a network, Intranet or Internet.

Oracle8 on Linux Brings Sophisticated Data Management Technology to a Broader Market

Oracle8, along with earlier versions of the product, is the most widely used database product in the market today. The functionality and versatility of the Oracle8 server has resulted in its deployment in a wide range of environments including manufacturing, financial, messaging, scientific and electronic commerce applications.

Linux is a Unix-like operating system initially developed in 1991 by Linus Torvalds at the University of Helsinki, Finland. It has gathered significant momentum over the years and has transitioned from an experimental, hobbyist OS to a full-featured commercial-quality platform that has been widely adopted. It is primarily different from other operating systems in that it is developed as an open-source product by the Internet community and is freely distributed under the GNU public license. Yet, this has not diminished its viability as a commercial OS as has been demonstrated by its wide adoption primarily for Internet applications.

Oracle8 on Linux brings together these two popular products to create a powerful and robust platform for deploying a variety of applications. It is Oracle's response to a strong demand for commercial applications on Linux. Further, it brings to the broader market a sophisticated computing environment that was hitherto available only on expensive, enterprise-class systems.

By using Oracle products on the Linux operating system running on Intel Architecture platforms, companies can build and deploy the powerful Oracle database and applications solutions that offer a lower total cost solution compared to other operating system environments such as Windows NT and commercial Unix. Oracle Applications on Linux offers enterprises a unique opportunity to deploy an internet-based solution on the operating system that powers the internet today.

Oracle8 on Linux incorporates the following enterprise-class features:

Performance and Scalability

- Multithreaded server architecture
- Unrestricted, row-level locking without lock escalation
- Non-blocking, multi-version read-consistency
- Cost-based optimization
- Parallel query and DML
- Dynamic and automatic resizing of database files
- Capable of scaling up to 512 petabytes.

Manageability and Availability

- Oracle8 Servers on Linux can be managed using the Enterprise Manager
- Parallel, online backup and recovery by file, tablespace or database
- Mirrored Redo log files

In addition, Oracle8 is tightly integrated with several other Oracle products including:

- Oracle Developer, Oracle Designer, AppBuilder
- Oracle Application Server
- Oracle Applications - Financials, Manufacturing, HR, Sales & Marketing, etc.

System Requirements

Recommended Intel server system requirements with Oracle8 on Linux

- An Intel architecture server system, such as the R440LX, N440BX, T440BX, L440GX or SC450NX server platforms.
- A single Intel® Pentium® II, Intel Pentium® III, Intel Pentium® Xeon™ or Intel Pentium® III Xeon™ processor - 300 MHz (or higher)
- Linux based kernel version 2.0.333 or higher (consult release notes before installing)
- Two, 2 GB drives — IDE or SCSI drive
- The Intel 10/100 network interface controller is integrated on the real server baseboard
- 16x CD-ROM (or better)
- SVGA video controller is integrated on the real server baseboard
- 64MB of EDO or SDRAM system memory
- VGA compatible monitor

Any Intel architecture-based server system, branded or a non-branded box meeting the above-mentioned basic hardware requirements

Requirements will vary depending on the usage and number of users being supported by the database.

Installation

Installation of Linux Operating System

The recipe to install Linux on an Intel Architecture server is available on the Intel Channel website at <http://channel.intel.com/go/serverbuilder>.

Installation of Oracle8 on Linux

After the Oracle8 database installation is complete, Oracle8 databases may require additional customization before it can be used. This section describes a single implementation used with the Oracle8 and Oracle8 Enterprise databases. Your specific implementation may vary depending on your specific utilization, quantity of users, network requirements and various applications being integrated with the Oracle8 and Oracle8 Enterprise databases. The following steps provide an overview of the Oracle8 installation:

1. Turn on your computer.
2. Ensure that your Linux operating system is running.
3. You will need to login to the Linux server. "localhost login" will appear, type "root" and press the "Enter" key on the keyboard. "Password" will appear, type "your Linux password" and press the "Enter" key on the keyboard.
4. "[root@localhost /root]#" will appear, type "mount /mnt/cdrom" and press the "Enter" key on the keyboard.

5. “[root@localhost /root]# “ will appear, type “mkdir /usr/u01” and press the “Enter” key on the keyboard.
6. Repeat step 5 three additional times replacing the “u01” in the statement with “u02”, “u03” and “u04” respectively.
7. “[root@localhost /root]# “ will appear, type “groupadd dba” and press the “Enter” key on the keyboard.
8. Insert the “Oracle 8.0.5 Linux” CD in the CDROM drive.
9. “[root@localhost cdrom]# “ will appear, type “chownoracle.dba /usr/u0?” and press the “Enter” key on the keyboard.
10. “[root@localhost /root]# “ will appear, type “useradd -g dba oracle” and press the “Enter” key on the keyboard.
11. “[root@localhost /root]# “ will appear, type “pico /etc/profile” and press the “Enter” key on the keyboard.
12. Change “PATH=\$PATH: /USR/X11R6/bin” in this file to “PATH=\$PATH: /USR/X11R6/bin:/usr/local/bin”
13. Press the keys on the keyboard “Ctrl” & “O” at the same time and press the “Enter” key on the keyboard.
14. Press the keys on the keyboard “Ctrl” & “X” at the same time and press the “Enter” key on the keyboard. This will exit the file.
15. “[root@localhost /root]# “ will appear, type “logout” and press the “Enter” key on the keyboard.
16. “localhost login” will appear, type “root” and press the “Enter” key on the keyboard.
17. “password” will appear, type “your Linux password” and press the “Enter” key on the keyboard.
18. “[root@localhost /root]# “ will appear, type “echo \$PATH” and press the “Enter” key on the keyboard.
19. “[root@localhost /root]# “ will appear, type “cd /mnt/cdrom” and press the “Enter” key on the keyboard.
20. “[root@localhost /root]# “ will appear, type “exportORACLE_OWNER=oracle” and press the “Enter” key on the keyboard.
21. “[root@localhost /root]# “ will appear, type “sh orainst/oratab.sh” and press the “Enter” key on the keyboard.
22. “Is it OK to continue (Y/N)?” will appear, select [Y] and press the “Enter” key on the keyboard.
23. “Are these settings correct (Y/N)?” will appear, select [Y] and press the “Enter” key on the keyboard.
24. “[root@localhost cdrom]# “ will appear, type “ls -l /etc/oratab” and press the “Enter” key on the keyboard.
25. “[root@localhost cdrom]# “ will appear, type “su - oracle” and press the “Enter” key on the keyboard.
26. “[oracle@localhost oracle]\$ “ will appear, type “umask” and press the “Enter” key on the keyboard.
27. “[oracle@localhost oracle]\$ “ will appear, type “mkdir -p /usr/u01/app/oracle/product/8.0.5” and press the “Enter” key on the keyboard.
28. “[oracle@localhost oracle]\$ “ will appear, type “export ORACLE_BASE=/usr/u01/app/oracle” and press the “Enter” key on the keyboard.
29. “[oracle@localhost oracle]\$ “ will appear, type “export ORACLE_HOME=\$ORACLE_BASE/product/8.0.5” and press the “Enter” key on the keyboard.

30. “[oracle@localhost oracle]\$ “ will appear, type “export LD_LIBRARY_PATH=\$ORACLE_HOME/lib” and press the “Enter” key on the keyboard.
31. “[oracle@localhost oracle]\$ “ will appear, type “export ORACLE_SID=svr1” and press the “Enter” key on the keyboard.
32. “[oracle@localhost oracle]\$ “ will appear, type “pico .bash_profile” and press the “Enter” key on the keyboard.
33. Go to the bottom of the entries under the line “export USERNAME BASH_ENV PATH” and type the following five lines in order:

```
export ORACLE_BASE=/usr/u01/app/oracle
export ORACLE_HOME=$ORACLE_BASE/product/8.0.5
export LD_LIBRARY_PATH=$ORACLE_HOME/lib
export ORACLE_SID=svr1
export PATH=$PATH:$ORACLE_HOME/bin
```

34. Press the keys “Ctrl” & “O” at the same time.
35. Press the keys “Ctrl” & “X” at the same time.
36. “[oracle@localhost oracle]\$” will appear, type “cd /mnt/cdrom” and press the “Enter” key on the keyboard.
37. “[oracle@localhost cdrom]\$” will appear, type “orainst/orainst” and press the “Enter” key on the keyboard.
38. “Install Type” will appear, leave it on the default setting and press the “Enter” key on the keyboard.
39. “Welcome to the New Oracle Installer!” will appear, and press the “Enter” key on the keyboard.
40. “Important Oracle Parallel Server Installation Note” will appear, and press the “Enter” key on the keyboard.
41. “Select the Installer active, (0) install, upgrade, or De-Install software” will appear, and press the “Enter” key on the keyboard.
42. “Install New Product – CreateDB Objects” will appear, and press the “Enter” key on the keyboard.
43. “Confirm, Change, or enter values for the environment variable listed:” will appear, and press the “Enter” key on the keyboard.
44. “The following values will be used” will appear, and press the “Enter” key on the keyboard.
45. “Software Asset Manager” will appear, select all items except the “Oracle8 Server, Release 8.0.5 documentation” using the up & down arrows making selections with the spacebar key on the keyboard.
46. Tab over to the “(Install)” option on the right of the screen, and press the “Enter” key on the keyboard.
47. “You have chosen to do a default database install” will appear, and press the “Enter” key on the keyboard.
48. “The environment variable ULIMIT is not set” will appear, and press the “Enter” key on the keyboard.
49. “Database Mount Points:” will appear, type in the following entries as listed below.

Point1: /usr/u02

Point2: /usr/u03

Point3: /usr/u04

and press the “Enter” key on the keyboard.

50. “Installer Actions Completed” will appear, and press the “Enter” key on the keyboard.
51. “Software Asset Manager” will appear, press the “X” on the keyboard to exit.
52. “Are you sure you want to exit the Oracle Installer?” will appear, the default selection will be (NO), change this entry by pressing the tab key to “(Yes)”, and press the “Enter” key on the keyboard.
53. “Result: Success
[oracle@localhost cdb]\$ “ will appear, type “\$ORACLE_HOME/bin/svrmgr1” and press the “Enter” key on the keyboard.
54. “SVRMGR>” will appear, type “connect internal” and press the “Enter” key on the keyboard.
55. “SVRMGR>” will appear, type “shutdown” and press the “Enter” key on the keyboard.
56. “SVRMGR>” will appear, type “quit” and press the “Enter” key on the keyboard.
57. “[oracle@localhost cdb]\$” will appear, type “exit” and press the “Enter” key on the keyboard.
58. “[oracle@localhost cdb]# ” will appear, type “cd /usr/u01/app/oracle/product/8.0.5/orainst” and press the “Enter” key on the keyboard.
59. “[oracle@localhost orainst]# ” will appear, type “sh root.sh” and press the “Enter” key on the keyboard.
60. “Are these settings correct [Y/N]? “ will appear, chose “[Y] and press the “Enter” key on the keyboard.
61. “Enter the full pathname of the local bin directory [/usr/bin]:” will appear, type “/usr/local/bin” and press the “Enter” key on the keyboard.
62. “OK to continue? [N]:” will appear, select “Y” and press the “Enter” key on the keyboard.
63. “[root@localhost orainst]# ” will appear, type “pico /etc/oratab” and press the “Enter” key on the keyboard.
64. Go to the last line listed, starts with “svr1:” and at the end of that line change the “N” to a “Y”.
65. Press the “Ctrl” & “O” keys at the same time and press the “Enter” key on the keyboard.
66. Press the “Ctrl” & “X” keys at the same time to exit.
67. “[oracle@localhost oracle]\$” will appear, type “exit” and press the “Enter” key on the keyboard.
68. “[root@localhost orainst]# “ will appear, type “cd ../bin” and press the “Enter” key on the keyboard.
69. “[root@localhost bin]# “ will appear, type “chown oracle:tnslnr” and press the “Enter” key on the keyboard.
70. “[root@localhost bin]# “ will appear, type “chmod uts tnslnr”” and press the “Enter” key on the keyboard.
71. “[root@localhost bin]# “ will appear, type “su - oracle” and press the “Enter” key on the keyboard.
72. “[oracle@localhost oracle]\$ “ will appear, type “dbstart” and press the “Enter” key on the keyboard. Database installation is complete. Now proceed to confirm database connectivity.
73. “[oracle@localhost oracle]\$ “ will appear, type “!snrctl start” and press the “Enter” key on the keyboard.
74. “[oracle@localhost oracle]\$ “ will appear, type “sqlplus system/manager” and press the “Enter” key on the keyboard.
75. “SQL>” will appear, type “exit” and press the “Enter” key on the keyboard.
76. “[oracle@localhost oracle]\$ “ will appear, type “tnsping svr1” and press the “Enter” key on the keyboard. Connection to database should be established.

77. “[oracle@localhost oracle]\$ “ will appear, type “sqlplus system/manager” and press the “Enter” key on the keyboard.
78. “SQL>” will appear, type “create user test identified by test;” and press the “Enter” key on the keyboard.
79. “SQL>” will appear, type “grant connect to test;” and press the “Enter” key on the keyboard.
80. “SQL>” will appear, type “exit” and press the “Enter” key on the keyboard.
81. “[oracle@localhost oracle]\$ “ will appear, type “sqlplus test/test” and press the “Enter” key on the keyboard. User-name = test, password = test.

Configuration of Oracle8 on Linux

The configuration step of using multiple hard disks is not a necessary step. In some cases a single hard disk will meet your requirements. This step is used to provide additional performance optimization of the database when the quantity of users is many database is large or leaving room for scalability.

In most Oracle database configuration, you must consider performance. One way to address performance is to stripe the Oracle database across multiple disks. As a rule of thumb, you can maximize performance by using as many disks as are available. In other words, spreading a 10 GB database across five 2 GB drives will perform better than one 10 GB database. This document is to be used as a guideline in a sample configuration. For more specific details, refer to the *Oracle8 Performance Tuning Guide*.

Striping the database is accomplished by using multiple tablespaces. Using multiple tablespaces allows you more flexibility in performing database operations. For example, you can store different tablespace datafiles across multiple drives to reduce I/O contention, thus, maximizing performance. For more details on creating and altering tablespaces, refer to Chapter 8 of the *Oracle8 Server Administrator's Guide*.

In an “ideal” configuration, there will be separate drives for Temporary tablespaces, Rollback tablespaces, System tablespaces, Multiple Redo tablespaces, Index tablespaces, and Datafile tablespaces. These tablespaces are created with default sizes when the database is installed. If you would like to change the tablespace or datafile sizes, refer to Chapter 8 of the *Oracle8i Server Administrator's Guide*. However, it is not always possible to have separate drives for all tablespaces, so you must consider where the disk contention is. For example, as a rule of thumb, the Datafile and Index tablespaces should always reside on different drives. It is also important to know if particular queries are accessing large amounts of data from a single drive. In this case, performance can be gained if the Datafile tablespace is striped across multiple drives. This can be accomplished with the Oracle Enterprise Manager Utility.

It is important to note that this is an “ideal” configuration and the above are recommendations on how to accomplish this. Using an Oracle8i database on one drive can perform satisfactorily for your particular application. A suitable response time depends on your particular application and needs.

Ordering Oracle8 on Linux for your customer?

Call the Oracle Direct Marketing Division (DMD) at 800.542.1170 to order a copy of Oracle8 on Linux. Press 0 to be connected to an operator and provide the operator with the city, state and zip code where the server will be INSTALLED. The operator will determine the representative in that area and can connect you to the appropriate DMD representative. The DMD representative can contact the customer (end-user) directly to confirm the number of users and provide various support level options. You can also provide the number of Concurrent Devices (users) to the DMD representative. "Concurrent Devices" are defined by Oracle as the maximum number of input devices accessing the Programs on the Designated System at any given point in time. There is a minimum required license level for Oracle8 of five (5) Concurrent Devices per Processor. Support level options sold with the licenses take the "Concurrent Devices" into account. Although the customer will be billed for the software, the DMD representative can ship Oracle8 directly to you for installation.

Please contact Saleem Haque, Shaque@us.oracle.com with any questions about this document. After you have received the software, please contact Oracle Support Services for all questions about Oracle8 including installation. A support contract, that includes instructions on how to contact Oracle Support, is sold with the software. A Customer Support Identification number is required to contact Oracle Support. This number is on the packing slip for the software and can also be obtained from the DMD representative.

How does your customer get technical support after delivery?

A Customer Support Identification (CSI) number is issued when the license/support order is booked and the software is shipped. The customer can use this CSI# to call in and get technical support from Oracle Support Services. If you are providing consulting services to your customer, you can use the customer's CSI# to contact Oracle Support at (650) 506-1500.



Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
USA

Worldwide Inquiries:
650.506.7000
Fax 650.506.7200
<http://www.oracle.com/>

To offer our customers the most complete and effective information management solutions, Oracle Corporation offers its products, along with support, education, and consulting, in more than 90 countries.

The information is provided as a convenience to Intel's general customer base. Users of the information should possess a minimum understanding of the functionality of elements of server systems, including but not limited to electromechanical connectors, power supplies, electronics bays, and cooling requirements, or should seek the advice of a competent expert.

Intel makes no warranty or representation, express or implied with respect to the accuracy, completeness of the information and assumes no responsibility for any errors which may appear in the document.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, or life sustaining applications. Intel may make changes to the information contained herein at any time, without notice.

Copyright (c) Intel Corporation 1998.

* Third-party brands and names are the property of their respective owners.

Oracle is a registered trademark, and Enabling the Information Age, Oracle7, Oracle8i, are trademarks of Oracle Corporation.

Copyright © Oracle Corporation 1998
All Rights Reserved