

Oracle® R Enterprise

Installation and Administration Guide

Release 1.4 for Windows, Linux, Solaris, and AIX

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Oracle R Enterprise Installation and Administration Guide, Release 1.4 for Windows, Linux, Solaris, and AIX
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Contents

Preface	vii
Audience	vii
Related Documents	vii
Documentation Accessibility	vii
Conventions	vii
Changes in This Release for Oracle R Enterprise Installation and Administration Guide	ix
Changes in <i>Oracle R Enterprise Installation and Administration Guide</i> for Release 1.4.....	ix
1 Overview of Oracle R Enterprise Installation	
1.1 About Oracle R Enterprise.....	1-1
1.2 About Oracle R Enterprise and Open Source R	1-1
1.3 About Oracle R Enterprise and Oracle R Advanced Analytics for Hadoop	1-2
1.4 Oracle R Enterprise Architecture.....	1-3
1.5 Client and Server Components of Oracle R Enterprise.....	1-3
1.6 Oracle R Enterprise Installation Steps.....	1-3
1.7 Oracle R Enterprise System Requirements	1-4
2 Installing and Configuring the Database for Oracle R Enterprise	
2.1 Installing Oracle Database for Oracle R Enterprise	2-1
2.2 Patching an 11.2.0.1 or 11.2.0.2 Database on Linux.....	2-1
2.3 Configuring EXTPROC for Embedded R Execution	2-2
3 Installing R for Oracle R Enterprise	
3.1 About Oracle R Distribution and Open Source R	3-1
3.2 Installing Oracle R Distribution on Linux	3-2
3.3 Installing Oracle R Distribution on Oracle Solaris.....	3-7
3.4 Installing Oracle R Distribution on IBM AIX.....	3-8
3.5 Installing Oracle R Distribution on Windows	3-9
3.6 Configuring Oracle R Distribution to Use MKL on the Client	3-10
4 Installing Oracle R Enterprise Server	
4.1 About Oracle R Enterprise Server	4-1

4.2	Oracle R Enterprise Server Requirements	4-2
4.3	Installing Oracle R Enterprise Server on Linux or UNIX.....	4-6
4.4	Installing Oracle R Enterprise Server on Microsoft Windows	4-8
4.5	Verifying the Oracle R Enterprise Server Installation	4-9
5	Installing Oracle R Enterprise on Exadata	
5.1	About Oracle R Enterprise on Exadata	5-1
5.2	Using DCLI to Install Oracle R Enterprise on Exadata	5-1
5.3	Installing Oracle R Distribution Across Exadata Compute Nodes	5-3
5.4	Installing Oracle R Enterprise Server Across Exadata Compute Nodes	5-5
6	Installing Oracle R Enterprise Client	
6.1	About Oracle R Enterprise Client.....	6-1
6.2	Installing Oracle Database Instant Client on Windows	6-3
6.3	Installing Oracle Database Instant Client on Linux or UNIX.....	6-4
6.4	Installing the Client Packages on Windows.....	6-6
6.5	Installing the Supporting Packages on Windows	6-8
6.6	Installing the Client Packages on Linux or UNIX.....	6-10
6.7	Installing the Supporting Packages on Linux or UNIX.....	6-11
7	Postinstallation Tasks for Oracle R Enterprise	
7.1	Creating a Database User for Oracle R Enterprise	7-1
7.2	Connecting Oracle R Enterprise Client to Oracle R Enterprise Server	7-3
7.3	Validating Basic Oracle R Enterprise Functionality.....	7-3
7.4	Running the Oracle R Enterprise Example Scripts	7-3
8	Administrative Tasks for Oracle R Enterprise	
8.1	Creating an Oracle Wallet for an Oracle R Enterprise Connection	8-1
8.2	Controlling Memory Used by Embedded R.....	8-2
8.3	Upgrading Oracle R Enterprise	8-3
8.4	Migrating Oracle R Enterprise Data.....	8-3
8.5	Uninstalling Oracle R Enterprise.....	8-4
8.6	Uninstalling R.....	8-5
A	A Sample Installation of Oracle R Enterprise	
A.1	About the Oracle R Enterprise Sample Installation Environment.....	A-1
A.2	Installing Oracle R Enterprise on the Server.....	A-2
A.3	Installing Oracle R Enterprise on the Client	A-5
A.4	Verifying the Oracle R Enterprise Installation.....	A-8
B	License Information for Oracle R Enterprise	
B.1	Licensing for Open Source R.....	B-1
B.2	Licensing for Oracle R Distribution.....	B-8
B.3	Licensing for ROracle	B-9

C Oracle R Distribution Packages

C.1	Packages in Oracle R Distribution.....	C-1
-----	--	-----

D Installing RStudio

D.1	About RStudio.....	D-1
D.2	Installing RStudio Server.....	D-1
D.3	Installing RStudio Desktop.....	D-2

Index

Preface

This document explains how to install and administer Oracle R Enterprise Release 1.4.

Audience

This document is intended for anyone who is responsible for installing or administering Oracle R Enterprise. Installation of Oracle R Enterprise requires knowledge of R and knowledge of Oracle Database.

Related Documents

The Oracle R Enterprise documentation set includes the following:

- *Oracle R Enterprise Installation and Administration Guide* (this manual)
- *Oracle R Enterprise User's Guide*
- *Oracle R Enterprise Release Notes*

The Oracle R Enterprise online documentation library is available at http://docs.oracle.com/cd/E36939_01/welcome.html

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.

Convention	Meaning
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Changes in This Release for Oracle R Enterprise Installation and Administration Guide

This preface describes changes in *Oracle R Enterprise Installation and Administration Guide* for Release 1.4.

Changes in Oracle R Enterprise Installation and Administration Guide for Release 1.4

- **R 3.0.1 requirement**

Oracle R Enterprise 1.4 requires R 3.0.1. As with earlier releases of Oracle R Enterprise, Oracle recommends that you use Oracle R Distribution.

See [Chapter 3, "Installing R for Oracle R Enterprise"](#).

- **Oracle R Distribution supported on Microsoft Windows**

Oracle R Distribution 3.0.1 is supported on 64-bit Windows in addition to the 64-bit Linux and UNIX platforms that were supported in earlier releases.

See [Section 3.5, "Installing Oracle R Distribution on Windows"](#).

- **Cairo package used for graphics display on the server**

Oracle R Enterprise 1.4 uses Cairo to display graphics on an Oracle R Enterprise server. Cairo is an open source R package that creates high quality bitmap, vector, and display output.

Cairo is bundled with the Oracle R Enterprise supporting packages. With Cairo, there is no longer a need to configure an X11 server on Oracle Solaris and AIX servers.

See [Section 6.1.3.2, "Oracle R Enterprise Supporting Packages"](#)

- **New client packages**

Oracle R Enterprise 1.4 includes two new client packages:

- `OREcommon` — Common low-level functionality for Oracle R Enterprise
- `OREembed` — Embedded R functionality for Oracle R Enterprise

See [Section 6.1.3.1, "Oracle R Enterprise Client Packages"](#).

- **Enhancements to Oracle R Enterprise Server installation script**

The Oracle R Enterprise Server 1.4 installation script includes these enhancements:

– **Configuration mode**

When the `configonly` flag is set, the Installer performs database configuration for Oracle R Enterprise but does not copy the Oracle R Enterprise libraries to `$ORACLE_HOME/lib` and does not install the Oracle R Enterprise client packages.

See [Section 4.1.3.1, "Configuration Mode"](#).

– **Prompts for the RQSYS password and displays the default password**

The default password is displayed so that the user can determine whether to accept the default password or specify a different password.

See [Section 4.1.3, "About the Oracle R Enterprise Server Installation Script"](#).

■ **Enhancements to `demo_user` script**

The `demo_user` script, which creates a database user for Oracle R Enterprise, can now enable an existing user for Oracle R Enterprise in addition to creating a new user.

See [Section 7.1, "Creating a Database User for Oracle R Enterprise"](#).

■ **Migration scripts**

Oracle R Enterprise 1.4 includes scripts for importing and exporting Oracle R Enterprise data and schema objects from a source environment to a target environment. The source and target must have the same version of Oracle Database and Oracle R Enterprise.

Overview of Oracle R Enterprise Installation

This chapter introduces the Oracle R Enterprise installation process. This chapter contains the following topics:

- About Oracle R Enterprise
- About Oracle R Enterprise and Open Source R
- About Oracle R Enterprise and Oracle R Advanced Analytics for Hadoop
- Oracle R Enterprise Architecture
- Client and Server Components of Oracle R Enterprise
- Oracle R Enterprise Installation Steps
- Oracle R Enterprise System Requirements

1.1 About Oracle R Enterprise

Oracle R Enterprise integrates R, the open source scripting language and environment, with Oracle Database. R supports advanced statistical analysis and has sophisticated graphical capabilities. Oracle R Enterprise provides powerful and scalable in-database algorithms for model building and data scoring. A component of the Oracle Advanced Analytics Option of Oracle Database, Oracle R Enterprise enables the R language to operate transparently on Oracle data and to execute user-defined R scripts through Oracle Database on the database server machine.

See Also:

- *Oracle R Enterprise User's Guide*
- *Oracle R Enterprise Release Notes*
- Oracle R Enterprise on the Oracle Technology Network:

<http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/index.html>

1.2 About Oracle R Enterprise and Open Source R

Oracle R Enterprise requires the installation of R, which is third-party, open source software. Open source R is governed by GNU General Public License (GPL) and not by Oracle licensing. The following Oracle tools facilitate and enable the use of R with Oracle Database:

- **Oracle R Distribution**

Oracle R Distribution is Oracle's free distribution of open source R. Oracle R Distribution offers these significant advantages for Oracle R Enterprise:

- Simplifies the installation of R for Oracle R Enterprise
- Simplifies integration with the Intel Math Kernel Library (MKL) on Linux and Windows platforms. MKL greatly improves the performance of many mathematical computations in R, including highly vectorized and threaded Linear Algebra, Fast Fourier Transforms (FFT), Vector Math, and Statistics functions.
- Automatically uses Sun Performance Library on Oracle Solaris systems. Like MKL for Linux and Windows, Sun Performance Library offers improved performance of many mathematical computations on Oracle Solaris. Sun Performance Library is part of Oracle Solaris Studio.
- Oracle provides support for Oracle R Distribution to customers of Oracle Advanced Analytics, Oracle Enterprise Linux, and Oracle Big Data Appliance.

Note: Oracle recommends that you use Oracle R Distribution with Oracle R Enterprise whenever possible.

If you choose to use open source R with Oracle R Enterprise, then you must build it from source. See [Section 3.1.2](#) for instructions.

■ ROracle

ROracle is an open source R package that enables interaction between R and Oracle Database. Originally developed by a third party, ROracle has been enhanced by Oracle and is now maintained and supported by Oracle. ROracle is one of the supporting packages used by Oracle R Enterprise.

See Also:

- [Section 3.1, "About Oracle R Distribution and Open Source R"](#)
- [Appendix B, "License Information for Oracle R Enterprise"](#)
- R Project for Statistical Computing at <http://www.r-project.org>

1.3 About Oracle R Enterprise and Oracle R Advanced Analytics for Hadoop

Oracle R Advanced Analytics for Hadoop provides a general computation framework in which you can create R scripts and execute them on an Hadoop cluster. Oracle R Advanced Analytics for Hadoop includes a collection of R packages that provides interfaces to work with Apache Hive tables, the Apache Hadoop compute infrastructure, the local R environment, and Oracle database tables.

Oracle R Advanced Analytics for Hadoop provides a basic level of access to Oracle Database. You can move the contents of a database table to HDFS, and move the results of HDFS analytics back to the database. You can then perform additional analysis on the reduced data set using Oracle R Enterprise.

See Also: "Using Oracle R Advanced Analytics for Hadoop" in *Oracle Big Data Connectors User's Guide*

1.4 Oracle R Enterprise Architecture

Oracle R Enterprise has a client-server architecture based on Oracle Database and Oracle Client. R engines run on the server computer and on each client computer.

- **SQL Transparency**

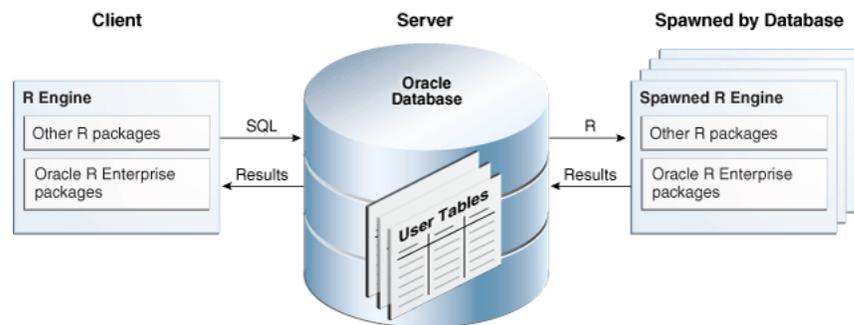
Oracle R Enterprise packages on the client support SQL transparency, which enables Oracle tables to appear "transparently" as native R objects. With SQL transparency, data analysts can use R to explore, cleanse, and transform data without having to know SQL.

- **Embedded R Execution**

Oracle R Enterprise packages, libraries, and R and SQL APIs on the server support the execution of R commands within SQL queries and PL/SQL statements. Embedded R is executed in spawned R engines that can run in parallel. With embedded R, you can execute R algorithms on very large data stores, and you can use database facilities like `DBMS_SCHEDULER` to schedule the execution of user-defined R functions for lights out processing.

Figure 1–1 illustrates the client-server architecture of Oracle R Enterprise.

Figure 1–1 Client-Server Architecture of Oracle R Enterprise



1.5 Client and Server Components of Oracle R Enterprise

Oracle R Enterprise has client components and server components:

- **Oracle R Enterprise Client Components:**

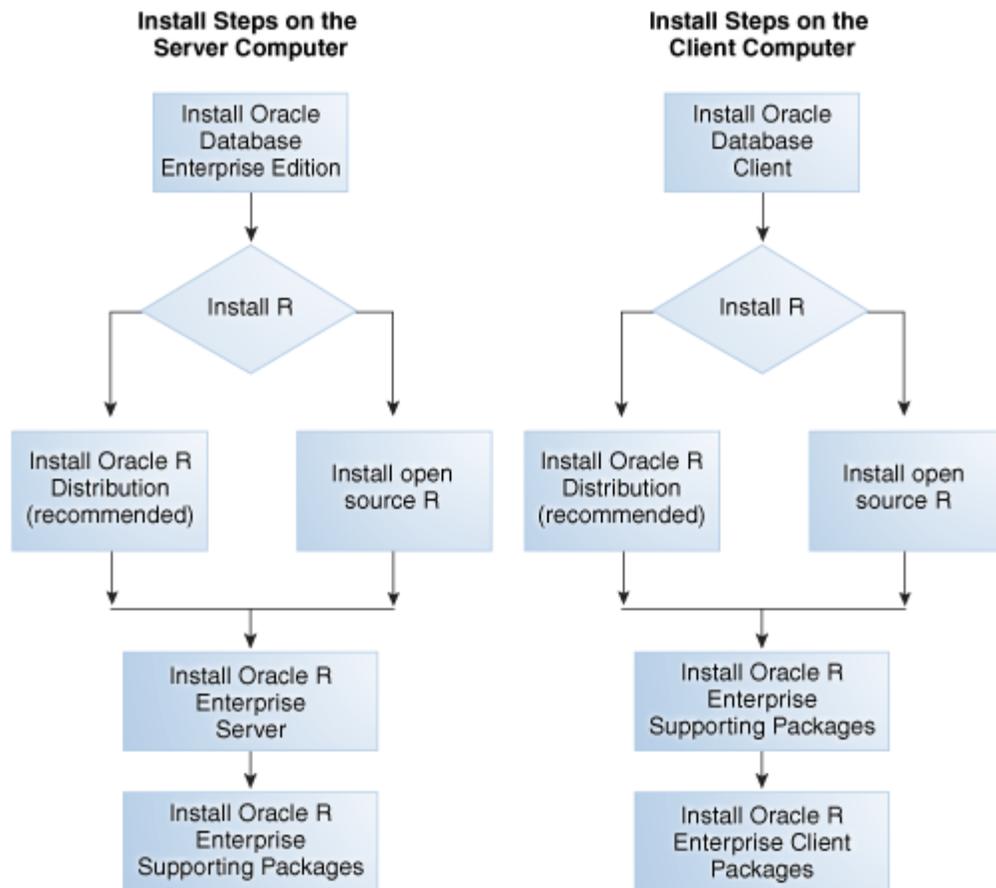
- Oracle Database Client
- Oracle R Enterprise packages and supporting, open source packages

- **Oracle R Enterprise Server Components:**

- Oracle Database with schema objects and shared libraries for supporting Oracle R Enterprise clients
- Oracle R Enterprise packages and supporting, open source packages

1.6 Oracle R Enterprise Installation Steps

The Oracle R Enterprise client and server installation steps are illustrated in Figure 1–2.

Figure 1–2 Oracle R Enterprise Client and Server Installation Steps

Note: If you intend to use both client and server components of Oracle R Enterprise on the computer that is hosting Oracle Database, then you do not need to perform a separate client installation. A local installation of Oracle Database Client is automatically included in the installation of Oracle Database.

1.6.1 Postinstallation Steps

After you install the software, you must create at least one database user for Oracle R Enterprise. A script for creating users is provided with Oracle R Enterprise Server.

See Also:

- [Chapter 7, "Postinstallation Tasks for Oracle R Enterprise"](#)
- [Appendix A, "A Sample Installation of Oracle R Enterprise"](#)

1.7 Oracle R Enterprise System Requirements

Oracle R Enterprise runs on 64-bit platforms only. Both client and server components are supported on each of the platforms described in [Table 1–1](#).

Table 1–1 Oracle R Enterprise Platform Requirements

Operating System	Hardware Platform	Description
Linux x86-64	Intel and AMD	<ul style="list-style-type: none"> ■ 64-bit Oracle Linux Release 5 update 6 through Oracle Linux 6 ■ 64-bit Red Hat Enterprise Linux Release 5 update 6 through Red Hat Enterprise Linux 6 <p>Oracle Linux may be running on Oracle Exadata Database Machine.</p>
Oracle Solaris	Intel and SPARC	<ul style="list-style-type: none"> ■ 64-bit Oracle Solaris 10 update 10 through Oracle Solaris 11 for both SPARC and x86-64 (Intel) platforms ■ Oracle SPARC SuperCluster ■ Oracle Solaris Studio (formerly Sun Studio) 12u3 or later <p>Oracle Solaris may be running on Oracle Exadata Database Machine.</p>
IBM AIX	IBM	64-bit IBM AIX 5.3 or higher
Microsoft Windows	Intel	64-bit Microsoft Windows XP, Vista, or Windows 7

Table 1–2 shows the supported configurations of Oracle R Enterprise server components.

Table 1–2 Oracle R Enterprise Server Support Matrix

Oracle R Enterprise	Open source R or Oracle R Distribution	Oracle Database (see Note)
1.0	2.13.2	11.2.0.3, 11.2.0.4, 12.1
1.1	2.13.2	11.2.0.3, 11.2.0.4, 12.1
1.2	2.15.1	11.2.0.3, 11.2.0.4, 12.1
1.3	2.15.1	11.2.0.3, 11.2.0.4, 12.1
1.3.1	2.15.1, 2.15.2, 2.15.3	11.2.0.3, 11.2.0.4, 12.1
1.4	3.0.1	11.2.0.3, 11.2.0.4, 12.1

Note: Oracle Database versions 11.2.0.1 and 11.2.0.2 are supported on Linux if patched. For instructions, see [Section 2.2, "Patching an 11.2.0.1 or 11.2.0.2 Database on Linux"](#).

On other platforms, Oracle Database 11.2.0.3, 11.2.0.4, or 12.1 is required.

Refer to: *Oracle R Enterprise Release Notes* for the latest platform requirements and the latest versions of R that are supported with Oracle R Enterprise.

Note: The RStudio Integrated Development Environment (IDE) is *not* included with Oracle R Enterprise. The RStudio IDE is a free, open source product that you can obtain and license from the RStudio company. See [Appendix D, "Installing RStudio"](#) for details.

Installing and Configuring the Database for Oracle R Enterprise

This chapter explains how to install and configure Oracle Database to support Oracle R Enterprise Server. This chapter contains these topics:

- Installing Oracle Database for Oracle R Enterprise
- Patching an 11.2.0.1 or 11.2.0.2 Database on Linux
- Configuring EXTPROC for Embedded R Execution

2.1 Installing Oracle Database for Oracle R Enterprise

Oracle R Enterprise requires the 64-bit version of Oracle Database Enterprise Edition. The database can be installed on any of the platforms described in [Table 1–1, "Oracle R Enterprise Platform Requirements"](#).

To install Oracle Database, follow the installation instructions for your platform:

- For Linux, see *Oracle Database Installation Guide for Linux*.
- For Oracle Solaris, see *Oracle Database Installation Guide for Oracle Solaris*.
- For IBM AIX, see *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit)*.
- For Microsoft Windows, see *Oracle Database Installation Guide for Microsoft Windows*.

Note: The current release of Oracle R Enterprise does not support multitenant container databases (CDB).

2.2 Patching an 11.2.0.1 or 11.2.0.2 Database on Linux

Oracle R Enterprise 1.4 requires Oracle Database 11.2.0.3, 11.2.0.4, or 12.1. On Linux, Oracle R Enterprise can also work with an 11.2.0.1 or 11.2.0.2 database if it is properly patched.

If you are running an earlier release of Oracle Database 11g Release 2 on Linux and you are unable to upgrade to 11.2.0.3 or later, then you can follow this procedure to patch the database:

1. Go to My Oracle Support:
<http://support.oracle.com>

2. Log in and supply your Customer Support ID (CSI).
3. Choose the Patches & Updates tab.
4. In the Patch Search box, type 11678127 and click **Search**.
5. Select the patch for your version of Oracle Database, either 11.2.0.1 or 11.2.0.2.
6. Click **Read Me**, and read the installation instructions and other details about the patch.
7. Click **Download** to download the patch.
8. Install the patch using OPatch. Ensure that you are using the latest version of OPatch.

See Also: "Patching Oracle Software With OPatch" in *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for instructions

2.3 Configuring EXTPROC for Embedded R Execution

An external procedure is a procedure invoked from a program that is written in a different language. Oracle Database uses an external procedure agent named `extproc` to support external procedures. Oracle R Enterprise uses `extproc` to support embedded R execution.

2.3.1 About EXTPROC

When an application invokes an external procedure, Oracle Database starts an `extproc` agent. The application uses the network connection established by Oracle Database to pass instructions to the agent for executing the procedure. The agent loads a DLL or shared library, runs the external procedure, and passes back to the application any values returned by the external procedure.

2.3.2 About EXTPROC Configuration for Oracle R Enterprise

Oracle R Enterprise uses the default configuration of `extproc`. The `extproc` agent is spawned directly by Oracle Database, and no configuration changes are required for either `listener.ora` or `tnsnames.ora`.

By default, `extproc` supports any external procedure call. If you want to only allow external procedure calls for Oracle R Enterprise, you can edit the `EXTPROC_DLLS` environment variable in `ORACLE_HOME/hs/admin/extproc.ora`.

The following statement on a Linux or UNIX system sets `EXTPROC_DLLS` to only execute external procedures for Oracle R Enterprise:

```
SET EXTPROC_DLLS=ONLY:$ORACLE_HOME/lib/ore.so
```

To allow `extproc` to service any external procedure, set `EXTPROC_DLLS` to `ANY` or simply leave it blank (the default).

See Also: "Default Configuration for External Procedures" in *Oracle Database Net Services Administrator's Guide* for details

Installing R for Oracle R Enterprise

This chapter explains how to install R for Oracle R Enterprise. This chapter contains these topics:

- [About Oracle R Distribution and Open Source R](#)
- [Installing Oracle R Distribution on Linux](#)
- [Installing Oracle R Distribution on Oracle Solaris](#)
- [Installing Oracle R Distribution on IBM AIX](#)
- [Installing Oracle R Distribution on Windows](#)
- [Configuring Oracle R Distribution to Use MKL on the Client](#)

Note: Instructions for installing Oracle R Distribution on Exadata are in [Chapter 5](#).

3.1 About Oracle R Distribution and Open Source R

Oracle R Enterprise requires an installation of R on the computer that hosts Oracle R Enterprise Server and on each computer that hosts an Oracle R Enterprise client. If you intend to use both client and server components of Oracle R Enterprise directly on the server, then only one installation of R is necessary.

See Also:

- [Table 1–2, "Oracle R Enterprise Server Support Matrix"](#) for the versions of R that are supported with Oracle R Enterprise
- [Section 1.2, "About Oracle R Enterprise and Open Source R"](#)

3.1.1 Oracle R Distribution for Oracle R Enterprise

Oracle recommends that you use Oracle R Distribution with Oracle R Enterprise whenever possible. Oracle R Distribution offers these advantages:

- Oracle R Distribution is compiled with the flags that are required by Oracle R Enterprise server components.
- On Linux and Windows platforms, Oracle R Distribution integrates seamlessly with the Intel Math Kernel Library (MKL) to provide high performance mathematical computations.
- On Solaris platforms, Oracle R Distribution automatically uses Sun Performance Library to provide high performance mathematical computations.

- Oracle provides support for Oracle R Distribution with Oracle R Enterprise.

See Also: [Section 1.2, "About Oracle R Enterprise and Open Source R"](#)

3.1.2 Open Source R for Oracle R Enterprise

You can use open source R with Oracle R Enterprise. Use the following R configuration parameters to build it from source:

```
./configure --with-lapack --with-ICU=no --enable-R-shlib
```

See Also: The *R Installation and Administration* manual for information about building R from source:

<http://www.r-project.org/>

3.2 Installing Oracle R Distribution on Linux

Oracle recommends that you use the Oracle public yum server for installing R on Linux. Oracle public yum is located at the following URL:

```
http://public-yum.oracle.com/
```

These topics explain how to install Oracle R Distribution on Linux systems:

- [Installing Oracle R Distribution on Oracle Linux Using Yum](#)
- [Installing Oracle R Distribution on Oracle Linux Using RPMs](#)
- [Installing Oracle R Distribution on Red Hat Enterprise Linux](#)

See Also: [Section 8.6.2, "Uninstalling Oracle R Distribution on Linux"](#)

3.2.1 Installing Oracle R Distribution on Oracle Linux Using Yum

Note: Before installing Oracle R Distribution, verify that your version of Oracle Linux is supported by Oracle R Enterprise. Refer to [Table 1–1, "Oracle R Enterprise Platform Requirements"](#).

You can use this command to verify the Linux version:

```
% uname -r
```

To install Oracle R Distribution on Oracle Linux Using Yum:

1. Log in to the Linux server as root and change to the `/etc/yum.repos.d` directory:

```
# cd /etc/yum.repos.d
```

2. List the contents of the directory to determine if the yum configuration file is present. The name of the configuration file is `public-yum-xxx.repo`, where `xxx` is either `e15`, for Oracle Linux 5, or `016`, for Oracle Linux 6.

If the yum configuration file is not present, then download it from Oracle public yum by executing the `wget` command for your Linux platform:

```
# wget http://public-yum.oracle.com/public-yum-e15.repo
```

or

```
# wget http://public-yum.oracle.com/public-yum-ol6.repo
```

3. Open `public-yum-xxx.repo` in a text editor and specify `enabled=1` for `xxx_latest` and `xxx_addons`, where `xxx` indicates the version of Linux, either `e15` or `ol6`:

```
[xxx_latest]
enabled=1
```

```
[xxx_addons]
enabled=1
```

The Oracle R Distribution packages reside in `xxx_addons`. The dependencies for the Oracle R Distribution RPMs reside in the latest Oracle Linux repository, `xxx_latest`.

Note: If you are not using the most recent version of Oracle Linux, and you want to install dependent packages that are specific to your version, then you must enable the corresponding Oracle Linux repository. For example, to enable the Oracle Linux 5.8 repository instead of the latest repository, follow these steps:

1. Open the yum configuration file for Oracle Linux 5 in an editor.

```
/etc/yum.repos.d/public-yum-e15.repo
```

2. Locate the section for Oracle Linux 5, update 8.

```
[ol5_u8_base]
```

3. Change `enabled=0` to `enabled=1`.

The result looks like this:

```
[ol5_u8_base]
name=Oracle Linux $releasever Update 8 installation media copy
($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL5/8/
base/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=1
```

4. Execute the `yum install` command to install R.

To install R-3.0.1:

```
# yum install R-3.0.1
```

To install the most recent version of R that is available on Oracle public yum:

```
# yum install R.x86_64
```

Note: Do not assume that the most recent version of R on Oracle public yum is supported by your version of Oracle R Enterprise. Consult [Table 1–2, "Oracle R Enterprise Server Support Matrix"](#) to determine which version of R you should use.

See Also: [Section 8.6.2, "Uninstalling Oracle R Distribution on Linux"](#)

3.2.2 Installing Oracle R Distribution on Oracle Linux Using RPMs

Oracle recommends that you use yum to install Oracle R Distribution. However, if yum is not available, you can install Oracle R Distribution using RPMs.

Note: Before installing Oracle R Distribution, verify that your version of Oracle Linux is supported by Oracle R Enterprise. Refer to [Table 1-1, "Oracle R Enterprise Platform Requirements"](#).

You can use this command to verify the Linux version:

```
% uname -r
```

To download and install the RPMs, log in as root and execute this command for each RPM listed in [Section 3.2.2.1](#):

```
# rpm -Uvh rpm_name
```

The Oracle R Distribution 3.0.1 RPMs are listed in these topics:

- [Oracle R Distribution 3.0.1 RPMs for Oracle Linux 5](#)
- [Oracle R Distribution 3.0.1 RPM Dependencies for Oracle Linux 5](#)
- [Oracle R Distribution 3.0.1 RPMs for Oracle Linux 6](#)

3.2.2.1 Oracle R Distribution 3.0.1 RPMs for Oracle Linux 5

The Oracle R Distribution RPMs for Oracle Linux 5 are listed as follows:

```
R-2.15.3-1.el5.x86_64.rpm
R-core-2.15.3-1.el5.x86_64.rpm
R-devel-2.15.3-1.el5.x86_64.rpm
libRmath-2.15.3-1.el5.x86_64.rpm
libRmath-devel-2.15.3-1.el5.x86_64.rpm
```

If the dependent RPMs for Oracle Linux 5, listed in [Section 3.2.2.2](#), are not automatically included, then download and install them explicitly.

3.2.2.2 Oracle R Distribution 3.0.1 RPM Dependencies for Oracle Linux 5

The Oracle R Distribution dependent RPMs for Oracle Linux 5 are listed as follows:

```
atk-1.12.2-1.fc6.x86_64.rpm
avahi-0.6.16-10.el5_6.x86_64.rpm
avahi-compat-libdns_sd-0.6.16-10.el5_6.x86_64.rpm
bitstream-vera-fonts-1.10-7.noarch.rpm
bzip2-devel-1.0.3-6.el5_5.x86_64.rpm
cairo-1.2.4-5.el5.x86_64.rpm
chkfontpath-1.10.1-1.1.x86_64.rpm
cpp-4.1.2-54.el5.x86_64.rpm
cups-1.3.7-30.el5_9.3.x86_64.rpm
cups-libs-1.3.7-30.el5_9.3.x86_64.rpm
dbus-python-0.70-9.el5_4.x86_64.rpm
desktop-file-utils-0.10-7.x86_64.rpm
dialog-1.0.20051107-1.2.2.x86_64.rpm
ed-0.2-39.el5_2.x86_64.rpm
gcc-4.1.2-54.el5.x86_64.rpm
gcc-c++-4.1.2-54.el5.x86_64.rpm
gcc-gfortran-4.1.2-54.el5.x86_64.rpm
ghostscript-8.70-14.el5_8.1.x86_64.rpm
ghostscript-fonts-5.50-13.1.1.noarch.rpm
```

```

gmp-4.1.4-10.el5.x86_64.rpm
gtk2-2.10.4-29.el5.x86_64.rpm
hicolor-icon-theme-0.9-2.1.noarch.rpm
libFS-1.0.0-3.1.x86_64.rpm
libX11-1.0.3-11.el5_7.1.x86_64.rpm
libX11-devel-1.0.3-11.el5_7.1.x86_64.rpm
libXau-devel-1.0.1-3.1.x86_64.rpm
libXdmp-devel-1.0.1-2.1.x86_64.rpm
libXfont-1.2.2-1.0.4.el5_7.x86_64.rpm
libfontenc-1.0.2-2.2.el5.x86_64.rpm
libgcc-4.1.2-54.el5.i386.rpm
libgcc-4.1.2-54.el5.x86_64.rpm
libgfortran-4.1.2-52.el5_8.1.i386.rpm
libgfortran-4.1.2-54.el5.x86_64.rpm
libstdc++-4.1.2-54.el5.i386.rpm
libstdc++-4.1.2-54.el5.x86_64.rpm
libstdc++-devel-4.1.2-54.el5.i386.rpm
libstdc++-devel-4.1.2-54.el5.x86_64.rpm
libtiff-3.8.2-18.el5_8.x86_64.rpm
mesa-libGL-6.5.1-7.11.el5_9.x86_64.rpm
mesa-libGL-devel-6.5.1-7.11.el5_9.x86_64.rpm
netpbm-10.35.58-10.el5.x86_64.rpm
netpbm-progs-10.35.58-10.el5.x86_64.rpm
pango-1.14.9-8.0.1.el5_7.3.x86_64.rpm
paps-0.6.6-20.el5.x86_64.rpm
pcre-6.6-6.el5_6.1.x86_64.rpm
pcre-devel-6.6-6.el5_6.1.x86_64.rpm
poppler-0.5.4-19.el5.x86_64.rpm
poppler-utils-0.5.4-19.el5.x86_64.rpm
tcl-8.4.13-6.el5.x86_64.rpm
tcl-devel-8.4.13-6.el5.x86_64.rpm
tetex-3.0-33.15.el5_8.1.x86_64.rpm
tetex-dvips-3.0-33.15.el5_8.1.x86_64.rpm
tetex-fonts-3.0-33.15.el5_8.1.x86_64.rpm
tetex-latex-3.0-33.15.el5_8.1.x86_64.rpm
texinfo-4.8-14.el5.x86_64.rpm
texinfo-tex-4.8-14.el5.x86_64.rpm
tk-devel-8.4.13-5.el5_1.1.x86_64.rpm
ttmkfdir-3.0.9-23.el5.x86_64.rpm
urw-fonts-2.3-6.1.1.noarch.rpm
xorg-x11-font-utils-7.1-3.x86_64.rpm
xorg-x11-proto-devel-7.1-13.el5.x86_64.rpm
xorg-x11-xfs-1.0.2-5.el5_6.1.x86_64.rpm
zlib-1.2.3-7.el5.i386.rpm
zlib-1.2.3-7.el5.x86_64.rpm
zlib-devel-1.2.3-7.el5.x86_64.rpm

```

3.2.2.3 Oracle R Distribution 3.0.1 RPMs for Oracle Linux 6

The Oracle R Distribution RPMs for Oracle Linux 6 are listed as follows:

```

R-3.0.1-2.el6.x86_64.rpm
R-core-3.0.1-2.el6.x86_64.rpm
R-devel-3.0.1-2.el6.x86_64.rpm
libRmath-3.0.1-2.el6.x86_64.rpm
libRmath-devel-3.0.1-2.el6.x86_64.rpm

```

If the following dependent RPM is not automatically included, then download and install it explicitly.

```

texinfo-tex-4.13a-8.el6.x86_64.rpm

```

3.2.3 Installing Oracle R Distribution on Red Hat Enterprise Linux

Note: Before installing Oracle R Distribution, verify that your version of Red Hat Enterprise Linux is supported by Oracle R Enterprise. Refer to [Table 1-1, "Oracle R Enterprise Platform Requirements"](#).

You can use this command to verify the Linux version:

```
% uname -r
```

The following installation instructions are specific to Red Hat Enterprise Linux 6. For Red Hat Enterprise Linux 5, change `ol6` to `el5`.

To install Oracle R Distribution on Red Hat Enterprise Linux 6:

1. Create an RPM build directory structure:

```
% mkdir -p /rpmbuild/{BUILD,RPMS,SOURCES,SPECS,SRPMS}
```

2. Set up RPM tools to use your own build tree (to avoid root login):

```
% echo '%_topdir %(echo $HOME)/rpmbuild' > /.rpmmacros
```

3. Download the source RPMs (*.src.rpm) from Oracle public yum. For Red Hat Enterprise Linux 6:

```
http://public-yum.oracle.com/repo/OracleLinux/OL6/
```

Save the source RPMs to the `rpmbuild/SRPMS` directory.

4. Rebuild Red Hat Enterprise Linux using `rpmbuild`.

```
% rpmbuild --rebuild /rpmbuild/SRPMS/R-3.0.1-1.el6.src.rpm
```

Note: If any dependencies are missing, install them as root.

The binary RPMs are built and saved under `/rpmbuild/RPMS`.

5. Log in as root and execute this command to install R:

```
# rpm -i path/rpmbuild/RPMS/R-core_RPM
```

For example, this command installs R 3.0.1 on Red Hat Enterprise Linux x86-64 version 6, where the path to `rpmbuild` is `/refresh/home/`.

```
# rpm -i /refresh/home/rpmbuild/RPMS/x86_64/R-core-3.0.1-1.el6.x86_64.rpm
```

See Also: [Section 8.6.2, "Uninstalling Oracle R Distribution on Linux"](#)

3.3 Installing Oracle R Distribution on Oracle Solaris

Note: Before installing Oracle R Distribution, verify that your version of Oracle Solaris is supported by Oracle R Enterprise. Refer to [Table 1–1, "Oracle R Enterprise Platform Requirements"](#).

You can use this command to verify the UNIX version:

```
% uname -r
```

To install Oracle R Distribution on Oracle Solaris:

1. Go to the Oracle Open Source Software Download page for Oracle R Distribution:

<https://oss.oracle.com/ORD/>

2. Download the files for your installation. The following are the files for R-3.0.1:

- For x86 64-bit systems:

```
ord-3.0.1-sol110-x86-64-sunstudio12u3.tar.gz
ord-3.0.1-supporting-sol110-x86-64-sunstudio12u3.tar.gz
```

- For SPARC 64-bit systems:

```
ord-3.0.1-sol110-sparc-64-sunstudio12u3.tar.gz
ord-3.0.1-supporting-sol110-sparc-64-sunstudio12u3.tar.gz
```

3. Uncompress the first file, either `sol110-x86-64` or `sol110-sparc`.
4. Run `install.sh` as root to install the Solaris PKG file for Oracle R Distribution.

```
# install.sh
```

5. Uncompress the second file, either `supporting-sol110-x86-64` or `supporting-sol110-sparc`, to a local directory such as `$ORACLE_HOME/lib`. Add that directory to `$LD_LIBRARY_PATH`.

These tar files contain the shared libraries for `libR.so`:

- `libiconv.so.2`
- `libncurses.so.5`
- `libreadline.so.6`
- `libsunperf.so`

`libsunperf.so`, Sun Performance Library, and its dependent shared libraries are included in Oracle Solaris Studio.

6. Run the following command to verify that `libR.so` is picking up its shared library dependencies correctly from the local directory.

```
# ldd -r /usr/lib/64/R/lib/libR.so
```

7. Start R by typing `R` at the command prompt:

```
% R
```

See Also: [Section 8.6.3, "Uninstalling Oracle R Distribution on Oracle Solaris"](#)

3.4 Installing Oracle R Distribution on IBM AIX

Note: Before installing Oracle R Distribution, verify that your version of IBM AIX is supported by Oracle R Enterprise. Refer to [Table 1–1, "Oracle R Enterprise Platform Requirements"](#).

You can use this command to verify the UNIX version:

```
% uname -r
```

To install Oracle R Distribution on IBM AIX:

1. Go to the Oracle Open Source Software Download page for Oracle R Distribution:

<https://oss.oracle.com/ORD/>

2. Download the files for your installation. The following are the files for R-3.0.1:

```
ORD.3.0.1.0.bff.gz
ord-supporting-aix.tar.gz
```

3. Uncompress and untar `ord-supporting-aix.tar.gz`:

```
$ gunzip ord-supporting-aix.tar.gz # get ord-supporting-aix.tar
$ tar -xvf ord-supporting-aix.tar # extract contents of .tar file
$ ls ord-supporting-aix # list of rpms
```

```
bash-4.2-5.aix5.1.ppc.rpm
libpng-devel-1.5.9-1.aix5.1.ppc.rpm
cairo-1.10.0-1.aix5.2.ppc.rpm
pixman-0.28.2-1.aix5.1.ppc.rpm
expat-2.0.1-3.aix5.1.ppc.rpm
pkg-config-0.25-2.aix5.1.ppc.rpm
fontconfig-2.5.0-1.aix5.1.ppc.rpm
readline-6.2-3.aix5.1.ppc.rpm
gettext-0.17-1.aix5.1.ppc.rpm
readline-devel-6.2-3.aix5.1.ppc.rpm
glib2-2.28.6-1.aix5.1.ppc.rpm
texinfo-4.13a-2.aix5.1.ppc.rpm
info-4.13a-2.aix5.1.ppc.rpm
xrender-0.9.1-3.aix5.2.ppc.rpm
libiconv-1.14-1.aix5.1.ppc.rpm
zlib-1.2.6-1.aix5.1.ppc.rpm
libpng-1.5.9-1.aix5.1.ppc.rpm
zlib-devel-1.2.6-1.aix5.1.ppc.rpm
```

You can also download these RPMs from <http://www.perzl.org/aix/>.

4. Install the RPMs as root using an `rpm` command:

```
$ cd /download_directory
$ su
# rpm -i *.rpm
```

To upgrade existing dependencies, use:

```
# rpm -UF *.rpm
```

If you experience conflicts with dependencies, use:

```
# rpm -UF --nodeps *.rpm
```

5. Add `/opt/freeware/lib` to the `LIBPATH` environment variable:

- For ksh:

```
$ export LIBPATH=/opt/freeware/lib:$LIBPATH
```

- For csh:

```
$ setenv LIBPATH /opt/freeware/lib:$LIBPATH
```

Ensure that `/opt/freeware/lib` is before `/usr/lib`.

6. Uncompress `ORD-2.15.1-aix.bff.gz` to get `ORD-2.15.1-aix.bff`:

```
$ gunzip ORD.2.15.1.0.bff.gz
```

7. To install all the filesets in Oracle R Distribution, execute the `installp` command (with the `apply` option) as root:

```
$ cd /download_directory
$ su
# installp -a -d . ORD # install all the filesets in ORD
```

You can also install independent filesets:

```
# installp -a -d . ORD.core # installs only ORE.core
# installp -a -d . ORD.devel # installs only ORE.devel
```

8. Run `ldd` to ensure that shared library dependencies were picked up correctly:

```
$ ldd /usr/lib/R/bin/exec/R
$ ldd /usr/lib/R/lib/libR.so (libiconv, libreadline)
$ ldd /usr/lib/R/lib/libRlapack.so
$ ldd /usr/lib/R/lib/libRblas.so
```

9. Add `/usr/lib/R/lib` to the `LIBPATH` environment variable:

- For ksh:

```
$ export LIBPATH=/usr/lib/R/lib:$LIBPATH
```

- For csh:

```
$ setenv LIBPATH /usr/lib/R/lib:$LIBPATH
```

See Also: Section 8.6.4, "Uninstalling Oracle R Distribution on IBM AIX"

3.5 Installing Oracle R Distribution on Windows

Before installing Oracle R Distribution, verify that your version of Microsoft Windows is supported by Oracle R Enterprise. Refer to [Table 1–1, "Oracle R Enterprise Platform Requirements"](#).

Follow these steps to install Oracle R Distribution on Windows:

1. Go to the Oracle Open Source Software Download page for Oracle R Distribution:

<https://oss.oracle.com/ORD/>

2. Under **R 3.0.1 Downloads**, select **Windows 64 bit**. Click **R Distribution** and save the zip file on your computer.

ORE-3.0.1-win.zip

3. Unzip the file and extract the executable file.
ORE-3.0.1-win.exe
4. Double click the executable file to start the installation of Oracle R Distribution.
5. Follow the instructions to complete the installation.

See Also: [Section 8.6.1, "Uninstalling Oracle R Distribution on Windows"](#)

3.6 Configuring Oracle R Distribution to Use MKL on the Client

The instructions in this section explain how to configure Oracle R Distribution to use MKL on a Linux or Windows client. With this simple configuration step, Oracle R Distribution dynamically uses MKL if it is installed on your system.

3.6.1 Enabling MKL Support for Oracle R Distribution on a Linux Client

Follow these steps to enable MKL for Oracle R Distribution on a Linux Client:

1. Install MKL. You can download MKL from the following web site:

<http://software.intel.com/en-us/intel-mkl>

Note: To install MKL on your computer, you must have an MKL license.

2. Add `libmkl_rt.so`, `$RHOME/lib`, and `$ORACLE_HOME/lib` to the `LD_LIBRARY_PATH` system environment variable. For example, in the Bash shell:

```
% export LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:
    /path_to/libmkl_rt.so:
    ${RHOME}/lib:
    ${ORACLE_HOME}/lib
```

3. Start R and execute the `Sys.BlasLapack` function:

```
R> Sys.BlasLapack()
$vendor
[1] "Intel Math Kernel Library (Intel MKL)"
$nthreads
[1] -1
```

The returned value of `$vendor` indicates that MKL has replaced the BLAS and LAPACK that are native to R.

The returned value of `nthreads` indicates the number of threads to be used by MKL. By default all available threads are used (`$nthreads=-1`).

3.6.1.1 Modifying the Number of Threads for MKL on Linux

You can change the number of threads to be used by MKL by editing the system environment variable `MKL_NUM_THREADS`. For example, the following statement in the Bash shell, causes MKL to use 3 threads:

```
% export MKL_NUM_THREADS=3
```

After setting `MKL_NUM_THREADS` to 3, the output of `Sys.BlasLapack` shows a value of 3 for `$nthreads`.

```
R> Sys.BlasLapack()
$vendor
[1] "Intel Math Kernel Library (Intel MKL)"
```

```
$nthreads
[1] 3
```

3.6.2 Enabling MKL Support for Oracle R Distribution on a Windows Client

Follow these steps to enable MKL for Oracle R Distribution on a Windows client (64-bit):

1. Install MKL. You can download MKL from the following web site:
<http://software.intel.com/en-us/intel-mkl>
2. Add the location of `libOrdBlasLoader.dll` and `mkl_rt.dll` to the PATH system environment variable. For instructions, see [Section 4.2.2.1, "Creating and Modifying Environment Variables on Windows"](#).

Note: In a typical installation of Oracle R Distribution 3.0.1, `libOrdBlasLoader.dll` is located in the R home directory:

```
C:\Program Files\R\R-3.0.1\bin\x64
```

In a full installation of MKL 11.1, `mkl_rt.dll` is located in the Intel MKL Composer XE directory:

```
C:\Program Files (x86)\Intel\Composer XE 2013 SP
```

3. Start R and execute the `Sys.BlasLapack` function:

```
R> Sys.BlasLapack()
$vendor
[1] "Intel Math Kernel Library (Intel MKL)"
$nthreads
[1] -1
```

The returned value of `$vendor` indicates that MKL has replaced the BLAS and LAPACK that are native to R.

The returned value of `nthreads` indicates the number of threads to be used by MKL. By default all available threads are used (`$nthreads = -1`).

3.6.2.1 Modifying the Number of Threads for MKL on Windows

You can change the number of threads to be used by MKL by editing the system environment variable `MKL_NUM_THREADS`. If `MKL_NUM_THREADS` does not exist, then you must create it as described in [Section 4.2.2.1](#):

After setting `MKL_NUM_THREADS` to 3, the output of `Sys.BlasLapack` shows a value of 3 for `$nthreads`.

```
R> Sys.BlasLapack()
$vendor
[1] "Intel Math Kernel Library (Intel MKL)"
$nthreads
[1] 3
```

See Also: [Section 4.2.2.1, "Creating and Modifying Environment Variables on Windows"](#)

Installing Oracle R Enterprise Server

This chapter explains how to install Oracle R Enterprise Server. This chapter includes these topics:

- About Oracle R Enterprise Server
- Oracle R Enterprise Server Requirements
- Installing Oracle R Enterprise Server on Linux or UNIX
- Installing Oracle R Enterprise Server on Microsoft Windows
- Verifying the Oracle R Enterprise Server Installation

Note: Instructions for installing Oracle R Enterprise Server on Exadata are in [Chapter 5](#).

4.1 About Oracle R Enterprise Server

- What Is Oracle R Enterprise Server?
- Server Components of Oracle R Enterprise
- About the Oracle R Enterprise Server Installation Script

4.1.1 What Is Oracle R Enterprise Server?

Oracle R Enterprise Server enables an Oracle database to support an Oracle R Enterprise client.

Oracle R Enterprise Server includes the following:

- The RQSYS schema
- Libraries used by Oracle Database
- Oracle R Enterprise packages, which support embedded R execution

4.1.2 Server Components of Oracle R Enterprise

Oracle R Enterprise includes several components that must be installed separately on the server computer.

These Oracle R Enterprise Server components must be installed in this order:

1. Oracle Database Enterprise Edition
2. Oracle R Distribution or open source R

3. Oracle R Enterprise Server, which includes the Oracle R Enterprise packages
4. Oracle R Enterprise supporting packages

An illustration of the client and server components of Oracle R Enterprise is shown in Figure 1-2.

4.1.3 About the Oracle R Enterprise Server Installation Script

The Oracle R Enterprise Server installation script performs the following:

1. Verifies the environment:
 - Verifies the presence of an R installation
 - Verifies the presence of the `libR.so`, `libRblas.so`, and `libRlapack.so` libraries in `$R_HOME/lib`, where `$R_HOME` is `/usr/lib64/R`
 - Verifies that `$ORACLE_HOME` and `$ORACLE_SID` are set
2. Starts SQL*Plus as `sysdba` and connects to the database specified in `ORACLE_SID`
3. In the database:
 - Determines if Oracle R Enterprise Server is already installed by querying `DBA_USERS` for the user `RQSYS`.
If `RQSYS` is found, the installer checks the version of Oracle R Enterprise in the `sys.rq_config` file. The Installer uses the version information later to install the correct PL/SQL packages.
 - Prompts for the location of permanent and temporary tablespaces for `RQSYS`. By default, the tablespaces are created in `SYSAUX` and `TEMP`.
 - Copies Oracle R Enterprise Server libraries to `$ORACLE_HOME/lib`.
 - Creates the `RQSYS` schema, if it does not already exist.
 - Prompts for the `RQSYS` password.
 - Creates objects in `RQSYS` and installs the Oracle R Enterprise PL/SQL packages.
4. Installs the Oracle R Enterprise client packages in `$ORACLE_HOME/R/library`.

4.1.3.1 Configuration Mode

The Oracle R Enterprise Server installer can run in configuration mode. When the `configonly` switch is specified, the Installer configures the database for Oracle R Enterprise, but does not install the Oracle R Enterprise client packages and does not copy the Oracle R Enterprise libraries to `$ORACLE_HOME/lib`.

```
./install.sh -configonly
```

If you have already performed a full installation of Oracle Enterprise Server, you can perform additional installations in configuration mode to enable other databases in the same Oracle Home for Oracle R Enterprise.

See Also: [Section 4.3](#) or [Section 4.4](#) for detailed installation instructions for Oracle R Enterprise Server.

4.2 Oracle R Enterprise Server Requirements

Before installing Oracle R Enterprise Server, verify the following requirements:

- [System Requirements](#)
- [Environment Variable Requirements](#)
- [User Requirements](#)

4.2.1 System Requirements

- The operating system must conform to the requirements specified in [Section 1.7](#).
- Oracle Database must be installed and configured as described in [Chapter 2](#).
- R must be installed as described in [Chapter 3](#).

4.2.1.1 Verifying 64-Bit Architecture on Microsoft Windows

Oracle R Enterprise only runs on 64-bit operating systems. You can determine if your Windows system is 64-bit by following these steps:

- Windows 7 or Windows Vista:
 1. From Windows Control Panel, choose **System**.
 2. Verify that **System type** is **64-bit Operating System**.
- Windows XP:
 1. From the Start menu, choose **My Computer**.
 2. Click **Properties**.
 3. On the **System** tab, verify that the system is **x64 Edition**.

4.2.2 Environment Variable Requirements

Before installing Oracle R Enterprise Server, ensure that environment variables are set as shown in [Table 4–1](#).

Table 4–1 Environment Variable Requirements for Oracle R Enterprise Server

Platform	Environment Variable Requirement
all	<p>ORACLE_SID must specify the service identifier (SID) of the database that will support Oracle R Enterprise.</p> <p>ORACLE_HOME must specify the home directory of the database identified by ORACLE_SID.</p>
Linux	<p>LD_LIBRARY_PATH must include \$ORACLE_HOME/lib.</p> <p>PATH must include \$ORACLE_HOME/bin.</p>
Oracle Solaris	<p>LD_LIBRARY_PATH must include \$ORACLE_HOME/lib.</p> <p>PATH must include \$ORACLE_HOME/bin.</p>
IBM AIX	<p>LIBPATH must include \$ORACLE_HOME/lib.</p> <p>PATH must include \$ORACLE_HOME/bin.</p>
Microsoft Windows	<p>PATH must include %ORACLE_HOME%\bin.</p>

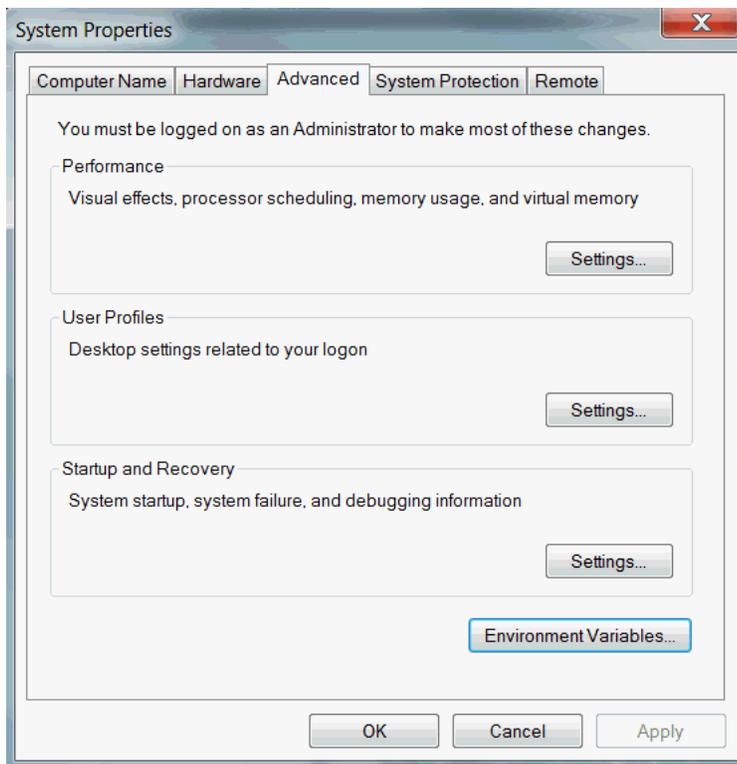
4.2.2.1 Creating and Modifying Environment Variables on Windows

If the **PATH**, **ORACLE_SID**, and **ORACLE_HOME** environment variables do not exist, you must create them and assign the values specified in [Table 4–1](#). On Windows systems, you must be an administrator to create or modify environment variables.

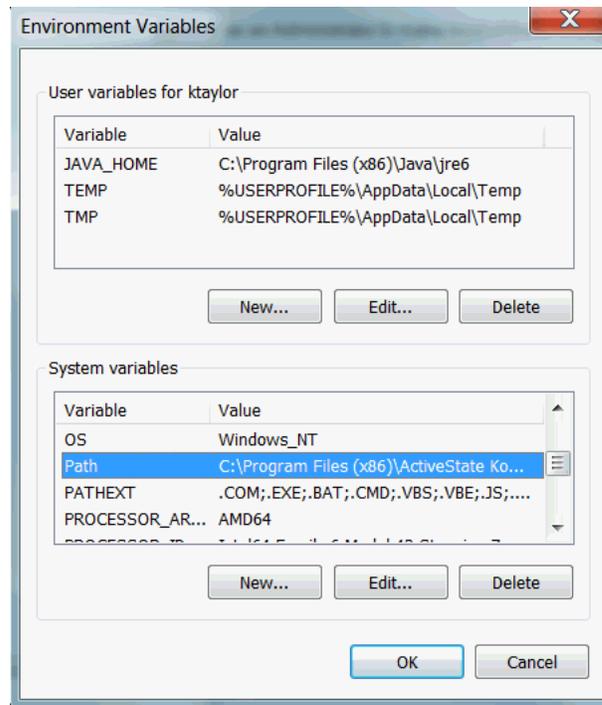
Follow these steps to create or modify environment variables on Windows:

- Windows 7 and Windows Vista:
 1. Right-click the **Computer** icon and choose **Properties**.
 2. Choose **Advanced system settings**.

Figure 4–1 Advanced System Settings in Windows



3. On the Advanced tab, click **Environment Variables**.

Figure 4–2 Environment Variables Dialog in Windows

4. Click **New** to create a new environment variable. Click **Edit** to modify an existing environment variable.
- Windows XP:
 1. Right-click the **My Computer** icon and choose **Properties**.
 2. On the Advanced tab, choose **Environment Variables**.
 3. Create or modify the environment variables.

4.2.3 User Requirements

The operating system user that installs Oracle R Enterprise Server must meet the requirements described in [Table 4–2](#).

Table 4–2 User Requirements for Oracle R Enterprise Server Installer

Platform	User Requirement
Linux and UNIX	<ul style="list-style-type: none"> ■ Member of the dba group ■ Has write access to \$ORACLE_HOME/lib
Microsoft Windows	<ul style="list-style-type: none"> ■ Administrator access ■ Member of the ora_dba group ■ Has write access to %ORACLE_HOME%\lib

4.2.3.1 About Operating System Authentication

The Oracle R Enterprise Server installation script uses **system authentication** to connect to the database identified by ORACLE_HOME and ORACLE_SID. System authentication is based on the operating system credentials of the user instead of the database credentials.

For example, on a Linux system, the Oracle R Enterprise installation script uses this statement to start SQL*Plus without a password:

```
$ORACLE_HOME/bin/sqlplus / as sysdba
```

Membership in a special operating system group enables system authentication for Oracle Database. The operating system group is created during installation of the database, and the identity of the installer is automatically assigned to the group. The generic name for the group is OSDBA. On Linux and UNIX, the name for OSDBA is dba. On Windows, the name for OSDBA is ora_dba.

The user that installs Oracle R Enterprise Server must belong to OSDBA.

See Also:

- "Using Operating System Authentication" in *Oracle Database Administrator's Guide*
- "Overview of Operating System Authentication Enabled at Installation" in *Oracle Database Platform Guide for Microsoft Windows*

4.2.3.2 Verifying the Group Membership of Your User ID

As described in "[About Operating System Authentication](#)", the Linux or UNIX user ID that runs the Oracle R Enterprise Server installation script must belong to the dba group. Membership in the dba group is also required for running other Oracle R Enterprise scripts on the server. On Windows, the dba group is called ora_dba.

To determine the group membership of your Linux or UNIX user ID, type this command:

```
% groups  
dba othergroup
```

To determine the group membership of your Windows user ID:

1. Open Windows Control Panel.
2. Select **Users Accounts**.
3. Select **Manage User Accounts**.
4. On the Users tab of the User Accounts dialog, the name, domain, and group of each user account are listed. Verify that your user ID belongs to the group ora_dba.

4.3 Installing Oracle R Enterprise Server on Linux or UNIX

These installation instructions apply to the Linux and UNIX platforms described in [Section 1.7](#).

To install Oracle R Enterprise Server on Linux or UNIX:

1. Ensure that your system satisfies the requirements specified in [Section 4.2, "Oracle R Enterprise Server Requirements"](#).
2. Ensure that your user ID has the permissions described in [Section 4.2.3, "User Requirements"](#)
3. Create an installation directory for the Oracle R Enterprise server components. The directory can have any name. For example:

```
/oreserver_install_dir
```

4. Go to the Oracle R Enterprise Downloads page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```

5. Accept the license agreement and select **Oracle R Enterprise Downloads (v1.4)**.
6. Select **Oracle R Enterprise Server Install for Oracle Database** for your platform. Save the file in the installation directory that you created in Step 3.

```
/oreserver_install_dir/ore-server-platform-arch-1.4.zip
```

7. Unzip the file as follows:

```
unzip ore-server-platform-arch-1.4.zip
```

The files are unzipped into the server subdirectory:

```
/oreserver_install_dir/server/
```

8. Run the installation script in the server subdirectory.

```
cd server/
./install.sh
```

To install Oracle R Enterprise Server in configuration mode, run the installer as follows:

```
./install.sh -configonly
```

See Also: [Section 4.1.3.1](#) for information about the `configonly` option

9. When prompted, provide a password and specify the tablespaces for the RQSYS schema. SYSAUX is the default permanent tablespace. TEMP is the default temporary tablespace.

Tip: Refer to [Section 4.1.3](#) for a description of the actions performed by the Oracle R Enterprise Server installation script.

10. When the Oracle R Enterprise Server installation script is finished, complete the installation by installing the supporting packages.

To install the supporting packages, follow these steps:

1. Return to the Oracle R Enterprise Downloads page on the Oracle Technology Network (Step 4).
2. Accept the license agreement and select **Oracle R Enterprise supporting Packages** for your platform. Save the file in the installation directory.

```
/oreserver_install_dir/ore-supporting-platform-arch-1.4.zip
```

3. Unzip the file as follows:

```
unzip ore-supporting-platform-arch-1.4.zip
```

The files are unzipped into the supporting subdirectory:

```
/oreserver_install_dir/supporting/
```

4. Install the packages in this order:

```

cd supporting
ORE CMD INSTALL ROracle_1.1-11_R_x86_64-unknown-linux-gnu.tar.gz
ORE CMD INSTALL DBI_0.2-7_R_x86_64-unknown-linux-gnu.tar.gz
ORE CMD INSTALL png_0.1-7_R_x86_64-unknown-linux-gnu.tar.gz
ORE CMD INSTALL cairo_1.5-2_R_x86_64-unknown-linux-gnu.tar.gz

```

The packages are installed in `$ORACLE_HOME/R/library`.

11. Follow the procedures in [Section 7.1](#) to create and configure a database user account for Oracle R Enterprise.

See Also: [Appendix A](#) for the steps in a typical installation of Oracle R Enterprise on a Linux server and Windows client

4.3.1 Installing Additional R Packages on Linux or UNIX

On Linux and UNIX platforms, the Oracle R Enterprise Server installation provides the `ORE` script, which you can run from the operating system prompt to install additional R packages. The `ORE` script is a wrapper for the R installation command: `R CMD INSTALL`.

By default, R packages are installed in `/usr/lib64/R/library`. The `ORE` script, however, installs R packages in a subdirectory under `$ORACLE_HOME/R/library`.

To execute the script:

```
ORE CMD INSTALL R_package_name
```

4.4 Installing Oracle R Enterprise Server on Microsoft Windows

These installation instructions apply to Microsoft Windows 64-bit platforms, as described in [Table 1-1](#).

To install Oracle R Enterprise Server on Windows:

1. Ensure that your system satisfies the requirements specified in [Table 4-2](#).
2. Ensure that your user ID has the permissions described in [Section 4.2.3, "User Requirements"](#)
3. Create an installation directory for the Oracle R Enterprise server components. The directory can have any name. For example:

```
c:\oreserver_install_dir
```

4. Go to the Oracle R Enterprise Downloads page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```

5. Accept the license agreement and select **Oracle R Enterprise Server Install for Oracle Database on Windows 64 bit platform**. Save the file in the installation directory that you created in Step 3.

```
c:\oreserver_install_dir\ore-server-win-x86_64-1.4.zip
```

6. Unzip the file. The files are unzipped in the server subdirectory:

```
c:\oreserver_install_dir\server
```

7. In a command window, change to the server subdirectory and execute the installation batch file:

```
cd c:\oreserver_install_dir\server
install.bat
```

To install Oracle R Enterprise Server in configuration mode, run the installer as follows:

```
install.bat -configonly
```

See Also: [Section 4.1.3.1](#) for information about the `configonly` option

8. When prompted, provide a password and the locations of permanent and temporary tablespaces for the `RQSYS` schema. `SYSAUX` and `TEMP` are used by default.

Tip: Refer to [Section 4.1.3](#) for a description of the actions performed by the Oracle R Enterprise Server installation script.

9. When the Oracle R Enterprise Server installation script is finished, complete the installation by installing the supporting packages.

To install the supporting packages, follow these steps:

1. Return to the Oracle R Enterprise Downloads page on the Oracle Technology Network (Step 4).
2. Accept the license agreement and select **Oracle R Enterprise supporting Packages for Windows Platform**. Save the file in the installation directory.

```
c:\oreserver_install_dir\ore-supporting-win-x86_64-1.4.zip
```

3. Unzip the file. The files are unzipped in the `supporting` subdirectory.

```
c:\oreserver_install_dir\supporting\
```

4. Start R from the Windows Start menu. If you have installed both 32- and 64-bit R, be sure to choose 64-bit R.

The R Console window is displayed.

5. Install the packages as follows:

```
install.packages("c:/oreserver_install_dir/supporting/
  ROracle_1.1-11.zip", repos=NULL)
install.packages("c:/oreserver_install_dir/supporting/
  DBI_0.2-7.zip", repos=NULL)
install.packages("c:/oreserver_install_dir/supporting/
  png_0.1-7.zip", repos=NULL)
install.packages("c:/oreserver_install_dir/supporting/
  cairo_1.5-2.zip", repos=NULL)
```

The packages are installed in `$ORACLE_HOME/R/library`.

10. Follow the procedures in [Section 7.1](#) to create and configure a user account for Oracle R Enterprise.

4.5 Verifying the Oracle R Enterprise Server Installation

The Oracle R Enterprise server installation script creates log files in the server subdirectory of the installation directory. Examine the log files to verify the success of the installation process.

The following commands on a Linux or UNIX system list the log files:

```
cd ./oreserver_install_dir/server
ls *.log
    rqinst.log  rqproc.log
```

If there are problems with the installation and you are unable to resolve them, you can request help from My Oracle Support or from the Oracle R Enterprise discussion forum.

- My Oracle Support — <https://support.oracle.com>
- Oracle R Enterprise Forum — https://forums.oracle.com/community/developer/english/business_intelligence/data_warehousing/r

See Also: Section A.4, "Verifying the Oracle R Enterprise Installation"

Installing Oracle R Enterprise on Exadata

This chapter explains how to install Oracle R Distribution and Oracle R Enterprise Server on Oracle Exadata Database Machine. This chapter includes these topics:

- [About Oracle R Enterprise on Exadata](#)
- [Using DCLI to Install Oracle R Enterprise on Exadata](#)
- [Installing Oracle R Distribution Across Exadata Compute Nodes](#)
- [Installing Oracle R Enterprise Server Across Exadata Compute Nodes](#)

5.1 About Oracle R Enterprise on Exadata

Exadata is an ideal platform for Oracle R Enterprise. The parallel resources of R computations in Oracle R Enterprise take advantage of the massively parallel grid infrastructure of Exadata.

To install Oracle R Enterprise on Exadata:

1. On *each* node:
 - Install Oracle R Distribution as described in [Chapter 3](#).
 - Verify and configure the environment as described in [Section 4.2, "Oracle R Enterprise Server Requirements"](#)
 - Install Oracle R Enterprise Server and the supporting packages as described in [Section 4.3](#).
2. On the *first* node only, create a user, as described in [Section 7.1](#).

You can simplify the process of installing Oracle R Enterprise on Exadata by using the **Distributed Command Line Interface (DCLI)** as described in the following topics.

5.2 Using DCLI to Install Oracle R Enterprise on Exadata

You can use DCLI to simplify the installation of Oracle R Enterprise on Exadata. With DCLI, you can use a single command to install Oracle R Distribution and Oracle R Enterprise Server across multiple Exadata compute nodes.

[Example 5–1](#) shows the output of the DCLI help option, which explains the basic syntax of the utility.

Example 5–1 DCLI Help Option Output

```
$ dcli -h
```

```
Distributed Shell for Oracle Storage
```

This script executes commands on multiple cells in parallel threads. The cells are referenced by their domain name or ip address. Local files can be copied to cells and executed on cells. This tool does not support interactive sessions with host applications. Use of this tool assumes ssh is running on local host and cells. The -k option should be used initially to perform key exchange with cells. User may be prompted to acknowledge cell authenticity, and may be prompted for the remote user password. This -k step is serialized to prevent overlaid prompts. After -k option is used once, then subsequent commands to the same cells do not require -k and will not require passwords for that user from the host. Command output (stdout and stderr) is collected and displayed after the copy and command execution has finished on all cells. Options allow this command output to be abbreviated.

Return values:

- 0 -- file or command was copied and executed successfully on all cells
- 1 -- one or more cells could not be reached or remote execution returned non-zero status.
- 2 -- An error prevented any command execution

Examples:

```
dcli -g mycells -k
dcli -c stsd2s2, stsd2s3 vmstat
dcli -g mycells cellcli -e alter iormplan active
dcli -g mycells -x reConfig.scl
```

usage: dcli [options] [command]

options:

--version	show program's version number and exit
-c CELLS	comma-separated list of cells
-d DESTFILE	destination directory or file
-f FILE	file to be copied
-g GROUPFILE	file containing list of cells
-h, --help	show help message and exit
-k	push ssh key to cell's authorized_keys file
-l USERID	user to login as on remote cells (default: celladmin)
-n	abbreviate non-error output
-r REGEXP	abbreviate output lines matching a regular expression
-s SSHOPTIONS	string of options passed through to ssh
--scp=SCPOPTIONS	string of options passed through to scp if different from sshoptions
--serial	serialize execution over the cells
-t	list target cells
--unkey	drop keys from target cells' authorized_keys file
-v	print extra messages to stdout
--vmstat=VMSTATOPS	vmstat command options
-x EXECFILE	file to be copied and executed

See Also: My Oracle Support for more details about DCLI. Go to the following web site, log in with your Customer Support Identifier, and type DCLI in the search box.

<https://support.oracle.com/>

5.3 Installing Oracle R Distribution Across Exadata Compute Nodes

This section explains how to run DCLI to install Oracle R Distribution across multiple Exadata Linux compute nodes. The commands are summarized in [Section 5.3.1](#).

Important: Before beginning the installation, review the instructions for installing Oracle R Distribution in [Chapter 3](#)

To install Oracle R Distribution on Exadata using DCLI, follow these steps:

1. Configure the Exadata environment to enable automatic authentication for DCLI on each compute node.

- a. Generate an SSH public-private key for the root user. Execute the following command as root on any node:

```
$ ssh-keygen -N '' -f /.ssh/id_dsa -t dsa
```

This command generates public and private key files in the `.ssh` subdirectory of the home directory of the root user.

- b. In a text editor, create a file that contains the names of all the compute nodes in the rack. Specify each node name on a separate line. For example, the nodes file for a 2-node cluster could contain entries like the following:

```
$ cat nodes
exadb01
exadb02
```

- c. Run the DCLI command with the `-k` option to establish SSH trust across all the nodes. The `-k` option causes DCLI to contact each node sequentially (not in parallel) and prompts you to enter the password for each node.

```
$ dcli -t -g nodes -l root -k -s "\-o StrictHostkeyChecking=no"
```

DCLI with `-k` establishes SSH Trust and User Equivalence. Subsequent DCLI commands will not prompt for passwords.

2. Log in as root to any compute node. Go to the Oracle Open Source Software Download page for Oracle R Distribution:

<https://oss.oracle.com/ORD/>

Download this file: `ord-linux-x86_64-3.0.1.tar.gz`

3. Create a directory and replicate the downloaded file in this directory across all nodes. For example, the following commands create the directory `/home/oracle/ORD` and replicate the file `ord-linux-x86_64-3.0.1.tar.gz` in this directory.

```
$ dcli -t -g nodes -l root mkdir -p /home/oracle/ORD
$ dcli -t -g nodes -l root -f ord-linux-x86_64-3.0.1.tar.gz -d
/home/oracle/ORD/ord-linux-x86_64-3.0.1.tar.gz
```

4. Uncompress and untar the file to replicate the dependent RPMs across all nodes.

```
$ dcli -t -g nodes -l root tar xvfz
/home/oracle/ORD/ord-linux-x86_64-3.0.1.tar.gz -C /home/oracle/ORD
$ ls /home/oracle/ORD/ord-linux-x86_64-3.0.1
```

Alternatively, you can download these RPMs from the Oracle public yum server at <http://public-yum.oracle.com/>.

Several of the dependencies required by the R development RPMs may cause conflicts during a standard Exadata upgrade. To avoid these conflicts, remove the following RPMs from the list:

```
gcc-gfortran
mesa-libGL-devel
libpng-devel
R-devel-3.0.1.el5.x86_64.rpm
```

5. To install the new RPMs and update existing RPMs across nodes, execute the following RPM command:

```
$ dcli -t -g nodes -l root rpm -i --force
/home/oracle/ORD/ord-linux-x86_64-3.0.1/*.rpm
```

The `--force` flag prevents errors from circular dependencies.

6. Verify the R installations on each node by first returning to the location where R is installed and then starting R.

```
$ dcli -g nodes -l oracle R RHOME
exadb01: /usr/lib64/R
exadb02: /usr/lib64/R
```

The following command returns this output for each node.

```
$ dcli -g nodes -l oracle R --vanilla
exadb01: Oracle Distribution of R version 3.0.1 (--) -- "Good Sport"
exadb01: Copyright (C) The R Foundation for Statistical Computing
exadb01: Platform: x86_64-unknown-linux-gnu (64-bit)
exadb01:
exadb01: R is free software and comes with ABSOLUTELY NO WARRANTY.
exadb01: You are welcome to redistribute it under certain conditions.
exadb01: Type 'license()' or 'licence()' for distribution details.
exadb01:
exadb01: Natural language support but running in an English locale
exadb01:
exadb01: R is a collaborative project with many contributors.
exadb01: Type 'contributors()' for more information and
exadb01: 'citation()' on how to cite R or R packages in publications.
exadb01:
exadb01: Type 'demo()' for some demos, 'help()' for on-line help, or
exadb01: 'help.start()' for an HTML browser interface to help.
exadb01: Type 'q()' to quit R.
exadb01:
exadb01: You are using Oracle's distribution of R. Please contact
exadb01: Oracle Support for any problems you encounter with this
exadb01: distribution.
```

5.3.1 DCLI Command Summary for Oracle R Distribution installation on Exadata

The DCLI commands used to install Oracle R Distribution 3.0.1 on a Linux Exadata system are listed in [Example 5-2](#).

Example 5-2 DCLI Command Summary for Oracle R Distribution

```
ssh-keygen -N " -f ~/.ssh/id_dsa -t dsa
vi nodes # enter node names
dcli -t -g nodes -l root -k -s "\-o StrictHostkeyChecking=no"
dcli -t -g nodes -l root mkdir -p /home/oracle/ORD
dcli -t -g nodes -l root -f ord-linux-x86_64-3.0.1.tar.gz -d
```

```

/home/oracle/ORD/ord-linux-x86_64-3.0.1.tar.gz
dcli -t -g nodes -l root tar xvfz /home/oracle/ORD/ord-linux-x86_64-3.0.1.tar.gz
-C /home/oracle/ORD
dcli -t -g nodes -l root rpm -i --force
/home/oracle/ORD/ord-linux-x86_64-3.0.1/*.rpm
dcli -g nodes -l root R RHOME
dcli -g nodes -l root R --vanilla

```

5.4 Installing Oracle R Enterprise Server Across Exadata Compute Nodes

This section explains how to run DCLI to install Oracle R Enterprise Server across multiple Exadata Linux compute nodes. The commands are summarized in [Section 5.4.1](#).

Important: Before beginning the installation, review the instructions for installing Oracle R Enterprise Server in [Chapter 4](#)

To install Oracle R Enterprise Server on Exadata using DCLI, follow these steps:

1. Go to the Oracle R Enterprise home page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/
```

Select **Oracle R Enterprise Downloads**. On the Downloads page, select Oracle R Enterprise Server and the Supporting Packages for Linux. The following files are downloaded for Oracle R Enterprise 1.4.

```
ore-server-linux-x86-64-1.4.zip
ore-supporting-linux-x86-64-1.4.zip
```

2. Copy the installers for Oracle R Enterprise Server and the supporting packages across nodes.

```

$ dcli -g nodes -l oracle mkdir -p /home/oracle/ORE
$ dcli -g nodes -l oracle -f ore-server-linux-x86-64-1.4.zip -d
/home/oracle/ORE/ore-server-linux-x86-64-1.4.zip
$ dcli -g nodes -l oracle -f ore-supporting-linux-x86-64-1.4.zip -d
/home/oracle/ORE/ore-supporting-linux-x86-64-1.4.zip

```

3. Unzip both installers:

```

$ dcli -t -g nodes -l oracle unzip
/home/oracle/ORE/ore-server-linux-x86-64-1.4.zip -d /home/oracle/ORE
$ dcli -t -g nodes -l oracle unzip
/home/oracle/ORE/ore-supporting-linux-x86-64-1.4.zip -d /home/oracle/ORE

```

4. Install Oracle R Enterprise server components:

```
$ dcli -t -g nodes -l oracle /home/oracle/ORE/server/./install.sh
```

5. Create an Oracle R Enterprise user:

```
$ dcli -t -g nodes -l oracle /home/oracle/ORE/server/./demo_user.sh
```

6. Execute the `demo_user.sh` script to grant privileges to the Oracle R Enterprise user. The default user is `rquser`. Because the database is shared, the privileges only need to be granted on a single node.

```
$ cd /home/oracle/ORE
```

```
$ sqlplus / as sysdba
grant RQADMIN to ruser;
grant CREATE TABLE to ruser;
grant CREATE SESSION to ruser;
grant CREATE VIEW to ruser;
grant CREATE PROCEDURE to ruser;
grant CREATE MINING MODEL to ruser;
```

7. Install Oracle R Enterprise supporting packages.

```
$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/DBI_0.2-7_R_x86_64-unknown-linux-gnu.tar.gz
$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/ROracle_1.1-11_R_x86_
64-unknown-linux-gnu.tar.gz
$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/png_0.1-7_R_x86_64-unknown-linux-gnu.tar.gz
$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/cairo_1.5-5_R_x86_64-unknown-linux-gnu.tar.gz
```

8. Verify Oracle R Enterprise loads.

```
> library(ORE)
Loading required package: OREbase
Attaching package: OREbase
The following objects are masked from 'package:base':
  cbind, data.frame, eval, interaction, order, paste, pmax, pmin,
  rbind, table
Loading required package: OREembed
Loading required package: OREstats
Loading required package: MASS
Loading required package: OREgraphics
Loading required package: OREeda
Loading required package: OREmodels
Loading required package: OREdm
Loading required package: lattice
Loading required package: OREpredict
Loading required package: ORExml
```

See Also:

- [Section 7.3, "Validating Basic Oracle R Enterprise Functionality"](#)
- [Section 7.4, "Running the Oracle R Enterprise Example Scripts"](#)[Section A.4, "Verifying the Oracle R Enterprise Installation"](#)

5.4.1 DCLI Commands Summary for Oracle R Enterprise Server

The DCLI commands used to install Oracle R Enterprise Server 1.4 and the supporting packages on a Linux Exadata system are listed in [Example 5–3](#).

Example 5–3 DCLI Command Summary for Oracle R Enterprise Server

```
dcli -g nodes -l oracle mkdir -p /home/oracle/ORE
dcli -g nodes -l oracle -f ore-server-linux-x86-64-1.4.zip -d
/home/oracle/ORE/ore-server-linux-x86-64-1.4.zip
dcli -g nodes -l oracle -f ore-supporting-linux-x86-64-1.4.zip -d
/home/oracle/ORE/ore-supporting-linux-x86-64-1.4.zip

dcli -t -g nodes -l oracle unzip
```

```
/home/oracle/ORE/ore-server-linux-x86-64-1.4.zip -d /home/oracle/ORE
dcli -t -g nodes -l oracle unzip
/home/oracle/ORE/ore-supporting-linux-x86-64-1.4.zip -d /home/oracle/ORE

dcli -t -g nodes -l oracle /home/oracle/ORE/server/./install.sh
dcli -t -g nodes -l oracle /home/oracle/ORE/server/./demo_user.sh

cd /home/oracle/ORE
sqlplus / as sysdba
grant RQADMIN to ruser;
grant CREATE TABLE to ruser;
grant CREATE SESSION to ruser;
grant CREATE VIEW to ruser;
grant CREATE PROCEDURE to ruser;
grant CREATE MINING MODEL to ruser;

$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/DBI_0.2-7_R_x86_64-unknown-linux-gnu.tar.gz
$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/ROracle_1.1-11_R_x86_64-unknown-linux-gnu.tar.gz
$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/png_0.1-7_R_x86_64-unknown-linux-gnu.tar.gz
$ dcli -t -g nodes -l oracle R CMD INSTALL
/home/oracle/ORE/supporting/cairo_1.5-5_R_x86_64-unknown-linux-gnu.tar.gz

dcli -t -g nodes -l oracle ORE -e "library(ORE)"
```

Installing Oracle R Enterprise Client

This chapter explains how to install Oracle R Enterprise Client. This chapter includes these topics:

- About Oracle R Enterprise Client
- Installing Oracle Database Instant Client on Windows
- Installing Oracle Database Instant Client on Linux or UNIX
- Installing the Client Packages on Windows
- Installing the Supporting Packages on Windows
- Installing the Client Packages on Linux or UNIX
- Installing the Supporting Packages on Linux or UNIX

6.1 About Oracle R Enterprise Client

This topic includes the following:

- Client Components of Oracle R Enterprise
- About Oracle Database Client Software
- About the Client Packages and Supporting Packages

6.1.1 Client Components of Oracle R Enterprise

Oracle R Enterprise includes several components that must be installed separately on each client computer. The Oracle R Enterprise client components, listed below, can be installed in any order:

- R (See [Chapter 3, "Installing R for Oracle R Enterprise"](#))
- Oracle Database Client Software
- Oracle R Enterprise client packages
- Oracle R Enterprise supporting packages

An illustration of the client and server components of Oracle R Enterprise is shown in [Figure 1-2](#).

6.1.2 About Oracle Database Client Software

ROracle, one of the supporting packages used by Oracle R Enterprise, requires an installation of Oracle Database client software to enable communication between an R

client and an Oracle database. The Database client can be either Oracle Database Client or Oracle Database Instant Client:

- **Oracle Database Client** is distributed with Oracle Database and is based in the Oracle Home of the database.
- **Oracle Database Instant Client** is a free, stand-alone implementation of Oracle Database Client. Oracle Instant Client is not based in an Oracle home directory and requires less disk space than Oracle Database Client.

6.1.3 About the Client Packages and Supporting Packages

The Oracle R Enterprise client packages and supporting packages are required on each client computer and on the server computer that hosts Oracle Database with Oracle R Enterprise Server. On the server, the client packages are installed automatically by the Oracle R Enterprise Server installation script.

6.1.3.1 Oracle R Enterprise Client Packages

The client packages, shown in [Table 6–1](#), are a set of Oracle proprietary packages that support Oracle R Enterprise.

Table 6–1 Oracle R Enterprise Client Packages

Package Name	Description
ORE	The top-level package for Oracle R Enterprise.
OREbase	Corresponds to the open source R base package.
OREcommon	Contains common low-level functionality for Oracle R Enterprise
OREdm	Exposes Oracle Data Mining algorithms through R.
OREeda	Contains functions for exploratory data analysis.
OREembed	Supports embedded R
OREgraphics	Corresponds to the open source R graphics package.
OREmodels	Contains functions for advanced analytical modeling.
OREpredict	Enables scoring data in Oracle Database using R models.
OREstats	Corresponds to the open source R stats package.
ORExml	Supports XML translation between R and Oracle Database.

6.1.3.2 Oracle R Enterprise Supporting Packages

The supporting packages, shown in [Table 6–2](#), are a set of open source packages that support the Oracle R Enterprise client packages.

Table 6–2 Oracle R Enterprise Supporting Packages

Package Name	Description
Cairo	Supports graphic rendering on Oracle R Enterprise server.
DBI	A database interface definition for communication between R and Oracle Database.
png	Supports the reading and writing of PNG images for Oracle R Enterprise objects.
ROracle	Oracle Database interface for R-based OCI.

6.2 Installing Oracle Database Instant Client on Windows

As described in [Section 6.1.2](#), Oracle R Enterprise requires Oracle Database client software. Oracle Instant Client is suitable for most configurations of Oracle R Enterprise.

To Install Oracle Instant Client on Windows:

1. Create an installation directory for the Oracle R Enterprise client components. For example:

```
c:\oreclient_install_dir
```

2. Go to the Oracle Database Instant Client page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/features/instant-client/
```

3. Select **See Instant Client downloads for all platforms**.
4. On the Instant Client Downloads page, select **Instant Client for Microsoft Windows (x64)**.
5. On the Instant Client Downloads for Microsoft Windows (x64) page, accept the license agreement.
6. Choose **Instant Client Package - Basic** or **Instant Client Package - Basic Lite** for your version of Oracle Database.

7. Save the file in the installation directory that you created in Step 1. For example:

```
c:\oreclient_install_dir\instantclient-basic-windows.x64-12.1.0.1.0.zip
```

8. Unzip the file. The files are extracted into a subdirectory called `instantclient_<version>`, where `version` is your version of Oracle Database. For example:

```
c:\oreclient_install_dir\instantclient_12_1
```

9. Return to the Instant Client Downloads for Microsoft Windows (x64) page:

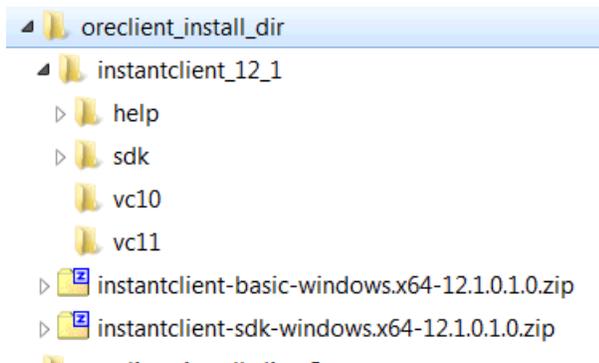
```
http://www.oracle.com/technetwork/topics/winx64soft-089540.html
```

10. Accept the license agreement and select **Instant Client Package - SDK** for your version of Oracle Database.

11. Save the file in the installation directory that you created in Step 1.

```
c:\oreclient_install_dir\instantclient-sdk-windows.x64-12.1.0.1.0.zip
```

12. Unzip the file. The files are extracted into the `instantclient_<version>` subdirectory. An Instant Client installation directory for Oracle Database 12.1 is shown in [Figure 6-1](#)

Figure 6–1 An Instant Client Installation Directory for Oracle Database 12.1

13. Add the full path of the Instant Client to the environment variables `OCI_LIB64` and `PATH`. The following steps set the variables to the path used in this example, `c:\myoreclient\instantclient_12_1`:

To set environment variables for Oracle Instant Client:

1. In Windows Control Panel, choose **System**.
2. Click **Advanced systems settings**.
3. On the **Advanced** tab, click **Environment Variables**.
4. Under **System variables**, create `OCI_LIB64` if it does not already exist. Set the value of `OCI_LIB64` to `c:\oreclient\instantclient_12_1`.
5. Under **System variables**, edit `PATH` to include `c:\oreclient\instantclient_12_1`.

Note: The graphical user interface for creating environment variables may vary slightly, depending on your version of Windows.

See Also:

- [Appendix A, "A Sample Installation of Oracle R Enterprise"](#)
- [Section 4.2.2.1, "Creating and Modifying Environment Variables on Windows"](#)

6.3 Installing Oracle Database Instant Client on Linux or UNIX

As described in [Section 6.1.2](#), Oracle R Enterprise requires Oracle Database client software. Oracle Instant Client is suitable for most configurations of Oracle R Enterprise.

This section contains these topics:

- [Installing Oracle Instant Client on Linux from RPMs](#)
- [Installing Oracle Instant Client on Linux or UNIX from a Zip File](#)

6.3.1 Installing Oracle Instant Client on Linux from RPMs

To Install Oracle Instant Client on Linux from RPMs:

1. Create an installation directory for the Oracle R Enterprise client components. For example:

```
mkdir oreclient_install_dir
```

2. Go to the Oracle Database Instant Client page on the Oracle Technology Network:
<http://www.oracle.com/technetwork/database/features/instant-client/>
3. Choose **See Instant Client downloads for all platforms**.
4. On the Instant Client Downloads page, choose **Instant Client for Linux x86-64**.
5. On the Instant Client Downloads page for Linux, accept the license agreement and select the RPM for **Instant Client Package - Basic** or the **Instant Client Package - Basic Lite**.
6. Save the file in the directory that you created in Step 1. For example:
`/oreclient_install_dir/oracle-instantclient12.1-basic-12.1.0.1.0-1.x86_64.rpm`
7. Return to the Instant Client Downloads page for Linux x86-64:
<http://www.oracle.com/technetwork/topics/linuxx86-64soft-092277.html>
8. Accept the license agreement and download the RPM for **Instant Client Package - SDK** for your version of Oracle Database. Save the file in the directory that you created in Step 1. For example:
`/oreclient_install_dir/oracle-instantclient12.1-sdk-12.1.0.1.0-1.x86_64.rpm`
9. The RPMs place the files in standard locations that the Oracle configuration script can find. For example, Oracle Instant Client 12.1 is installed in `/usr/lib/oracle/12.1/client64/lib`.
10. After installing Oracle Instant Client, add the path of the Oracle Instant Client libraries to `LD_LIBRARY_PATH`. For example:
`export LD_LIBRARY_PATH=/usr/lib/oracle/12.1/client64/lib:$LD_LIBRARY_PATH`

6.3.2 Installing Oracle Instant Client on Linux or UNIX from a Zip File

To Install Oracle Instant Client on Linux or UNIX for a zip file:

1. Create an installation directory for the Oracle R Enterprise client components. For example:
`mkdir oreclient_install_dir`
2. Go to the Oracle Database Instant Client page on the Oracle Technology Network:
<http://www.oracle.com/technetwork/database/features/instant-client/>
3. Select **See Instant Client downloads for all platforms**. On the Instant Client Downloads page, select the Instant Client for your platform.
4. Accept the license agreement and select the **Instant Client Package - Basic** or **Instant Client Package - Basic Lite** rpm for your version of Oracle Database.
5. Save the file in the installation directory that you created in Step 1. For example:
`\oreclient_install_dir\instantclient-basic-linux.x64-12.1.0.1.0.zip`
6. Unzip the file. The files are extracted into a subdirectory called `instantclient_`*version*, where *version* is your version of Oracle Database. For example:
`unzip instantclient-basic-linux.x64-12.1.0.1.0.zip`
`ls`
`instantclient_12_1/`

```
instantclient-basic-linux.x64-12.1.0.1.0.zip
```

7. Return to the Instant Client Downloads page:

```
http://www.oracle.com/technetwork/database/features/instant-client/index-097480.html
```

8. Select the Instant Client for your platform.
9. On the Instant Client Downloads page for your platform, accept the license agreement and select **Instant Client Package - SDK** for your version of Oracle Database.
10. Save the file in the installation directory that you created in Step 1. For example:

```
\oreclient_install_dir\instantclient-sdk-linux.x64-12.1.0.1.0.zip
```

11. Unzip the file. The contents are extracted into the `instantclient_version` subdirectory.

```
unzip instantclient-sdk-linux.x64-12.1.0.1.0.zip
ls
  /instantclient_12_1
  instantclient-basic-linux.x64-12.1.0.1.0.zip
  instantclient-sdk-linux.x64-12.1.0.1.0.zip
cd instantclient_12_1
ls
  /help
  /sdk
  /vc10
  /vc11
```

6.4 Installing the Client Packages on Windows

Install the Oracle R Enterprise client packages on each client computer. The client packages are automatically included in the installation on the server.

This section contains these topics:

- [Downloading the Client Packages on Windows](#)
- [Installing the Client Packages on Windows](#)

6.4.1 Downloading the Client Packages on Windows

To download the client packages:

1. Go to the Oracle R Enterprise Downloads page on the Oracle Technology Network:


```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```
2. Accept the License Agreement.
3. Choose **Oracle R Enterprise Client Packages for Windows Platform**. Download and save the file in the installation directory that you created for Oracle Instant Client. For example:

```
c:\oreclient_install_dir\ore-client-win-x86_64-1.4.zip
```

Note: Choose the same installation directory for all Oracle R Enterprise client components.

4. Unzip the file. The contents are extracted into the `client` subdirectory:
The resulting installation directory, shown in [Example 6–1](#), contains Oracle Instant Client and Oracle R Enterprise client packages.

Example 6–1 Client Installation Directory Containing Client Packages and Instant Client

```
c:\oreclient_install_dir
  \client
    \ORE_1.4.zip
    \OREbase_1.4.zip
    \OREcommon_1.4.zip
    \OREdm_1.4.zip
    \OREeda_1.4.zip
    \OREembed_1.4.zip
    \OREgraphics_1.4.zip
    \OREpredict_1.4.zip
    \OREstats_1.4.zip
    \ORExml_1.4.zip
  \instantclient_12_1
instantclient-basic-linux.x64-12.1.0.1.0.zip
instantclient-sdk-linux.x64-12.1.0.1.0.zip
ore-client-win-x86_64-1.4.zip
```

6.4.2 Installing the Client Packages on Windows

Choose one of the following methods to install the Oracle R Enterprise client packages on Windows:

- [Installing the Client Packages from the R Console](#)
- [Installing the Client Packages from the R GUI](#)
- [Installing the Client Packages from the Windows Command Prompt](#)

6.4.2.1 Installing the Client Packages from the R Console

1. Start R x64 from the Windows Start menu.
2. Execute this R command for each zip file in the `client` directory:

```
install.packages("oreclient_install_dir/client/client_package_name.zip",
repos=NULL)
```

Each successful package installation produces this message in the R console:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

6.4.2.2 Installing the Client Packages from the R GUI

1. Start R x64 from the Windows Start menu.
2. Select **Packages** from the **RGui (64-bit)** menu bar.
3. From the **Packages** menu, select **Install package(s) from local zip files**.
4. Change to the `client` directory.
5. Select all the files in the directory.

6. Click Open.

Each package installation produces this message in the R console:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

6.4.2.3 Installing the Client Packages from the Windows Command Prompt

1. Start R x64 from the Windows Start menu.
2. Open a Windows command window.
3. Change directory to the `client` directory and type these commands:

```
R CMD INSTALL OREbase_1.4.zip
R CMD INSTALL OREcommon_1.4.zip
R CMD INSTALL OREstats_1.4.zip
R CMD INSTALL OREgraphcs_1.4.zip
R CMD INSTALL OREeda_1.4.zip
R CMD INSTALL OREembed_1.4.zip
R CMD INSTALL ORExml_1.4.zip
R CMD INSTALL OREdm_1.4.zip
R CMD INSTALL OREpredict_1.4.zip
R CMD INSTALL ORE_1.4.zip
```

Each package installation generates this message:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

6.5 Installing the Supporting Packages on Windows

Install the Oracle R Enterprise supporting packages on each client computer and on the server computer.

This section contains these topics:

- [Downloading the Supporting Packages on Windows](#)
- [Installing the Supporting Packages on Windows](#)

6.5.1 Downloading the Supporting Packages on Windows

To download the supporting packages:

1. Go to the Oracle R Enterprise Downloads page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```
2. Accept the License Agreement.
3. Choose **Oracle R Enterprise Supporting Packages for Windows Platform**. Download and save the file in the Oracle R Enterprise client installation directory. For example:

```
c:\oreclient_install_dir\ore-supporting-win-x86_64-1.4.zip
```

Note: Choose the same installation directory for all Oracle R Enterprise client components.

4. Unzip the file. The contents are extracted into the `supporting` subdirectory:

The resulting installation directory, shown in [Example 6–2](#), contains all the client components: Oracle Instant Client, Oracle R Enterprise client packages, and Oracle R Enterprise supporting packages.

Example 6–2 Client Installation Directory Containing All Client Components

```
c:\oreclient_install_dir
  \client
    \instantclient_12_1
      \supporting
        \cairo_1.5-5.zip
        \DBI_0.2-7.zip
        \png_0.1-7.zip
        \ROracle_1.1-11.zip
instantclient-basic-linux.x64-12.1.0.1.0.zip
instantclient-sdk-linux.x64-12.1.0.1.0.zip
ore-client-win-x86_64-1.4.zip
ore-supporting-win-x86_64-1.4.zip
```

6.5.2 Installing the Supporting Packages on Windows

Choose one of the following methods to install the Oracle R Enterprise supporting packages on Windows:

- [Installing the Supporting Packages from the R Console](#)
- [Installing the Supporting Packages Using the R GUI](#)
- [Installing the Supporting Packages from the Windows Command Prompt](#)

6.5.2.1 Installing the Supporting Packages from the R Console

1. Start R x64 from the Windows Start menu.
2. Execute this command for each zip file in the supporting directory:

```
install.packages("oreclient_install_dir\support\support_package_name.zip",
                 repos=NULL)
```

Each package installation produces this message in the R console:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

6.5.2.2 Installing the Supporting Packages Using the R GUI

1. Start R x64 from the Windows Start menu.
2. From the main menu, select **Packages**.
3. Select **Install package(s) from local zip files**.
4. Browse to `\oreclient_install_dir\supporting`.
5. Select all of the files in the directory.
6. Click **Open**.

Each package installation produces this message in the R console:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

6.5.2.3 Installing the Supporting Packages from the Windows Command Prompt

1. Start R x64 from the Windows Start menu.

2. Open a command window.
3. Change to `\oreclient_install_dir\supporting` directory and type these commands:

```
R CMD INSTALL ROracle_1.1-11.zip
R CMD INSTALL DBI_0.2-7.zip
R CMD INSTALL png_0.1-7.zip
R CMD INSTALL cairo_1.5-5.zip
```

Each package installation produces this message in the R console:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

6.6 Installing the Client Packages on Linux or UNIX

Install the Oracle R Enterprise client packages on each client computer. The client packages are automatically included in the installation on the server.

- [Downloading the Client Packages on Linux or UNIX](#)
- [Installing the Client Packages on Linux or UNIX](#)

6.6.1 Downloading the Client Packages on Linux or UNIX

To download the client packages:

1. Go to the Oracle R Enterprise Downloads page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```

2. Accept the License Agreement.
3. Choose **Oracle R Enterprise Client Packages** for your platform. Download and save the file in the installation directory that you created for Oracle Instant Client. For example:

```
/oreclient_install_dir/ore-client-platform-arch.zip
```

Note: Choose the same installation directory for all Oracle R Enterprise client components.

4. Unzip the file:

```
% unzip ore-client-platform-arch.zip
```

When you unzip the file, the `/client` directory is created and these files are extracted.

```
/client/ORE_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREbase_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREcommon_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREdm_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREeda_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREembed_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREgraphics_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREpredict_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/OREstats_1.4_R_arch-unknown-platform-gnu.tar.gz
/client/ORExml_1.4_R_arch-unknown-platform-gnu.tar.gz
```

6.6.2 Installing the Client Packages on Linux or UNIX

To install the client packages:

1. Change to `/oreclient_install_dir/client`.
2. Execute the following commands:

```
R CMD INSTALL ORE_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREbase_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREcommon_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREdm_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREeda_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREembed_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREgraphics_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREpredict_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREstats_1.4_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL ORExml_1.4_R_arch-unknown-platform-gnu.tar.gz
```

6.7 Installing the Supporting Packages on Linux or UNIX

Install the Oracle R Enterprise supporting packages on each client computer and on the server computer that hosts Oracle R Enterprise Server.

- [Downloading the Supporting Packages on Linux or UNIX](#)
- [Installing the Supporting Packages on Linux or UNIX](#)

6.7.1 Downloading the Supporting Packages on Linux or UNIX

To download the supporting packages:

1. Go to the Oracle R Enterprise Downloads page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```

2. Accept the License Agreement.
3. Choose **Oracle R Enterprise Supporting Packages** for your platform. Download and save the file in the client installation directory. For example:

```
/oreclient_install_dir/ore-supporting-platform_arch.zip
```

Tip: Choose the same installation directory for all Oracle R Enterprise client components.

4. Unzip the file:

```
unzip ore-supporting-platform_arch.zip
```

When you unzip the file, the supporting directory is created and these files are extracted.

```
/supporting/cairo_1.5-5_R_arch-unknown-platform.tar.gz
/supporting/DBI_0.2-7_R_arch-unknown-platform.tar.gz
/supporting/png_0.1-7_R_arch-unknown-platform.tar.gz
/supporting/ROracle_1.1-11_R_arch-unknown-platform.tar.gz
```

6.7.2 Installing the Supporting Packages on Linux or UNIX

To install the supporting packages:

1. Change directory to `/oreclient_install_dir/supporting`.

2. Execute these commands:

```
R CMD INSTALL DBI_0.2-7_R_arch-unknown-platform.tar.gz
R CMD INSTALL ROracle_1.1-11_R_arch-unknown-platform.tar.gz
R CMD INSTALL png_0.1-7_R_arch-unknown-platform.tar.gz
R CMD INSTALL cairo_1.5-5_R_arch-unknown-platform.tar.gz
```

Postinstallation Tasks for Oracle R Enterprise

This chapter explains how to establish and verify a working environment for Oracle R Enterprise after the software is installed. This chapter contains these topics:

- [Creating a Database User for Oracle R Enterprise](#)
- [Connecting Oracle R Enterprise Client to Oracle R Enterprise Server](#)
- [Validating Basic Oracle R Enterprise Functionality](#)
- [Running the Oracle R Enterprise Example Scripts](#)

7.1 Creating a Database User for Oracle R Enterprise

After you install Oracle R Enterprise client and server, you must create and configure a database user for Oracle R Enterprise. You can do this by running a script that is supplied with Oracle R Enterprise Server.

The following topics provide instructions for creating an Oracle R Enterprise user:

- [Executing the demo_user Script](#)
- [Granting Privileges to an Oracle R Enterprise User](#)
- [Granting the RQADMIN Role](#)

7.1.1 Executing the demo_user Script

The `demo_user` script validates the Oracle R Enterprise Server environment and either creates a new user or enables an existing user for Oracle R Enterprise.

To create or modify a database user for Oracle R Enterprise:

1. Verify that your operating system user ID is a member of the OSDBA group (`dba` on Linux and UNIX; `ora_dba` on Windows). See [Section 4.2.3.1](#) for details about OSDBA.
2. Navigate to the Oracle R Enterprise server directory:

```
cd download_directory/server
```
3. Run the `demo_user` script:

```
-- Linux or UNIX
./demo_user.sh

-- Windows
demo_user.bat
```

4. The script validates your environment as shown:


```
Checking ORACLE_HOME ..... Pass
Checking ORACLE_SID ..... Pass
Checking sqlplus ..... Pass
Checking ORACLE instance ..... Pass
Checking ORE ..... Pass
```
5. If the environment is valid, the script displays the value of ORACLE_HOME and ORACLE_SID.
6. The script displays the following:


```
Do you wish to create an ORE user? [yes]

Type yes or press Enter to create a new user for Oracle R Enterprise.
Type no if you want to modify an existing user.
```
7. To create a new user, specify a user name and password. The default user name is rouser.
 - Provide the permanent tablespace for the user. The default is USERS.
 - Provide the temporary tablespace for the user. The default is TEMP.
 To modify an existing user, type the user name.

7.1.2 Granting Privileges to an Oracle R Enterprise User

Oracle R Enterprise users require a basic set of database privileges. Some users may require additional privileges, depending on the tasks they need to perform and the data they need to access.

To grant the basic privileges to RUSER, start SQL*Plus as sysdba and execute these GRANT statements:

```
sqlplus / AS SYSDBA
GRANT CREATE TABLE TO RUSER;
GRANT CREATE PROCEDURE TO RUSER;
GRANT CREATE VIEW TO RUSER;
GRANT CREATE MINING MODEL TO RUSER;
```

7.1.3 Granting the RQADMIN Role

The Oracle R Enterprise server installation creates a database role called RQADMIN. A user with the RQADMIN role can create and drop R scripts in the database R script repository for use with embedded R execution.

To grant RQADMIN to RUSER, start SQL*Plus as sysdba and execute this GRANT statement:

```
sqlplus / AS SYSDBA
GRANT RQADMIN to RUSER;
```

Note: Use caution when granting the RQADMIN role. Only users that require Oracle R Enterprise administrative privileges should have this role.

7.2 Connecting Oracle R Enterprise Client to Oracle R Enterprise Server

To connect Oracle R Enterprise client to the database, start R using the ORE script:

```
% ORE
R> library(ORE)
```

The following examples connect as user RUSER with password RUSERpsw:

- For a remote database, specify the Oracle Database service identifier (SID), the host name, and the port for the connection.

```
ore.connect(user="RUSER", sid="orcl", host="SVR3", password="RUSERpsw",
            port=1521, all=TRUE)
```

Note: To avoid specifying the password and other connection details in embedded R scripts, you can use Oracle Wallet. See ["Creating an Oracle Wallet for an Oracle R Enterprise Connection"](#) on page 8-1.

- For a local database, specify the connection as follows:

```
ore.connect("RUSER", password="RUSERpsw", conn_string="", all=TRUE)
```

7.3 Validating Basic Oracle R Enterprise Functionality

After connecting as described in [Section 7.2](#), you can test some of the basic functionality of Oracle R Enterprise with these commands:

```
## Is the ORE client connected to the ORE server?
## The output of this command should be TRUE.
ore.is.connected()

## List the available database tables
ore.ls()

## Push an R dataframe to a database table
cars <- ore.push(cars)
head(cars)

## Run embedded R
ore.doEval(function() { 123 })
```

7.4 Running the Oracle R Enterprise Example Scripts

You can further verify the success of the installation by running the Oracle R Enterprise demo scripts. If a script runs to completion without errors, then the example is successful.

The example scripts are located in `$ORACLE_HOME/R/library/ORE/demo`.

This R command provides a list of available examples:

```
demo(package="ORE")
```

These commands run two of the examples. The `aggregate` script tests the use of an R function on data that is resident in database memory; the `row_apply` script tests embedded R execution.

```
demo("aggregate", package="ORE")
demo("row_apply", package="ORE")
```

This command exits from R.

```
q()
```

Administrative Tasks for Oracle R Enterprise

This chapter describes administrative tasks for maintaining and optimizing Oracle R Enterprise. This chapter contains these topics:

- Creating an Oracle Wallet for an Oracle R Enterprise Connection
- Controlling Memory Used by Embedded R
- Upgrading Oracle R Enterprise
- Migrating Oracle R Enterprise Data
- Uninstalling Oracle R Enterprise
- Uninstalling R

8.1 Creating an Oracle Wallet for an Oracle R Enterprise Connection

An Oracle wallet is a password-protected container for storing security credentials in Oracle Database. Wallets provide a secure mechanism for specifying connection details in embedded R scripts.

To create a wallet for an Oracle R Enterprise connection:

1. Start Oracle Wallet Manager:
 - (Linux and UNIX) At the command line, enter `owm`.
 - (Windows) Select **Start, Programs, Oracle-HOME_NAME, Integrated Management Tools, Wallet Manager**.
2. Follow the instructions in your Oracle Database documentation to create the wallet:
 - For Oracle Database 11.2, see: "Using Oracle Wallet Manager" in *Oracle Database Advanced Security Administrator's Guide*
 - For Oracle Database 12.1, see: "Using Oracle Wallet Manager" in *Oracle Database Enterprise User Security Administrator's Guide*.
3. Locate the connection string for the Oracle R Enterprise database in `tnsnames.ora`. For example:

```
mydb_test =
  (DESCRIPTION =
    (ADDRESS =
      (PROTOCOL = TCP)
      (HOST = server23)
      (PORT = 1521)
    )
  )
```

```
(CONNECT_DATA = (sid=ORCL))
)
```

4. Specify the connection information in the wallet. Follow the instructions in the Oracle Database security documentation referenced in step 2.
5. After you configure the wallet, you can connect to the Oracle R Enterprise server database by simply specifying the connection identifier. For example:

```
ore.connect(conn_string = "mydb_test", all = TRUE)
```

To learn more about `ore.connect`, use the R help command:

```
help(ore.connect)
```

8.2 Controlling Memory Used by Embedded R

You can control the memory used by embedded R execution by limiting the heap memory (vector and cons in R terminology) that is automatically managed by the R gc mechanism. To limit the size of heap memory in the database, use the `sys.rqconfigset` utility. The keyword arguments for `sys.rqconfigset` are described in Table 8-1.

Table 8-1 *SYS.RQCONFIGSET Keyword Arguments*

Keyword	Default	Description
MIN_VSIZE	32MB	Minimum R vector heap memory
MAX_VSIZE	4GB	Maximum R vector heap memory
MIN_NSIZE	1M	Minimum number of R cons cells
MAX_NSIZE	20M	Maximum number of R cons cells

Example 8-1 *SQL Commands for Controlling Memory Used by Embedded R*

```
-- Set the minimum R vector heap memory to 20MB
EXEC sys.rqconfigset('MIN_VSIZE', '20MB');

-- Set the maximum R vector heap memory to 100MB
EXEC sys.rqconfigset('MAX_VSIZE', '100MB')

-- Set the minimum number of R cons cells to 500x1024
EXEC sys.rqconfigset('MIN_NSIZE', '500K');

-- Set the maximum number of R cons cells to 10x10x1024
EXEC sys.rqconfigset('MAX_NSIZE', '10MB');

-- Set maximum vector heap memory and maximum cons cells to unlimited
EXEC sys.rqconfigset('MAX_VSIZE', NULL);
EXEC sys.rqconfigset('MAX_NSIZE', NULL);
```

Note: The `sys.rqconfigset` procedure does not control the C type memory that may be allocated by `Calloc`, `Realloc`, `calloc`, or `malloc`. Such C type memory is mainly created to hold temporary values used by R functions that are implemented in C. Under normal circumstances, C type memory is limited in size and does not significantly affect the memory usage of R.

The `sys.rqconfigset` procedure edits settings in a configuration table called `sys.rq_config`. You can view the contents of this table to verify various environment settings for Oracle R Enterprise. Among the settings stored in `sys.rq_config` are the memory limits for embedded R. If necessary, you can modify these memory limits, however in most cases you should not modify the values in `sys.rq_config`.

The following query shows sample values stored in `sys.rq_config`.

```
SQL> SELECT * FROM sys.rq_config;
```

NAME	VALUE
R_HOME	/usr/lib64/R
R_LIBS_USER	/dbhome_1/R/library
VERSION	1.4
MIN_VSIZE	32M
MAX_VSIZE	4G
MIN_NSIZE	2M
MAX_NSIZE	20M
SUPP_LIB_PATH	/opt/freeware/lib

8.3 Upgrading Oracle R Enterprise

You can upgrade Oracle R Enterprise to the current release from any previous release by reinstalling the product.

Note on IBM AIX: Upgrade from Oracle R Enterprise 1.1 is not supported on IBM AIX. To upgrade Oracle R Enterprise 1.1 on IBM AIX, first uninstall Oracle R Enterprise 1.1 (including R) and then download and install the later version.

To upgrade Oracle R Enterprise:

1. Ensure that you have the version of R that is required for the new version of Oracle R Enterprise. See *Oracle R Enterprise Release Notes* for the latest requirements.

To install R, follow the instructions in [Chapter 3, "Installing R for Oracle R Enterprise"](#).

2. To upgrade Oracle R Enterprise Server, follow the installation procedures. When the installation script detects an earlier version of Oracle R Enterprise, it asks if you want to upgrade. Answering `No` aborts the process; answering `Yes` starts the upgrade.

See [Chapter 4](#) for the Oracle R Enterprise Server installation instructions.

3. To upgrade Oracle R Enterprise Client, re-install the client packages and supporting packages. You do not have to uninstall the current packages before installing the new packages.

See [Chapter 6](#) for the Oracle R Enterprise Client installation instructions.

8.4 Migrating Oracle R Enterprise Data

Oracle R Enterprise Server includes migration scripts that you can run to migrate the `rqsys` schema and Oracle R Enterprise user data from a source database to a target

database. The source and target must have the same version of the database and of Oracle R Enterprise Server.

You can run the migration scripts on all the operating systems listed in [Table 1-1](#), "Oracle R Enterprise Platform Requirements" except Windows.

To locate the scripts, navigate to the server directory and change to the migration subdirectory.

```
/oreserver_install_dir/server/migration
```

The migration subdirectory contains a README and the following subdirectories:

- `exp` — contains the script `ore_srcexport.pl` for exporting `rqsys` and all Oracle R Enterprise user data to a dump file.
- `imp` — contains the script `ore_destimport.pl` for importing `rqsys` and all Oracle R Enterprise user data from the dump file created by `ore_srcexport.pl`.
- `oreuser` — contains scripts for exporting and importing data for a specific Oracle R Enterprise user.

Instructions for running the migration scripts are provided in the README.

8.5 Uninstalling Oracle R Enterprise

To uninstall Oracle R Enterprise, follow the instructions in the following topics:

- [Uninstalling Oracle R Enterprise Server](#)
- [Uninstalling Oracle R Enterprise Client](#)
- [Uninstalling R](#)

8.5.1 Uninstalling Oracle R Enterprise Server

An uninstall script is included with the Oracle R Enterprise Server files in the `server` directory. The script removes the libraries that were installed in `$ORACLE_HOME/lib` and drops all the database objects that were created by the Oracle R Enterprise Server installation.

The user that runs the uninstall script must satisfy the requirements specified in [Section 4.2.3](#), "User Requirements".

On a Linux system, you could uninstall Oracle R Enterprise Server as follows:

```
cd download_path/server/  
./uninstall.sh
```

8.5.2 Uninstalling Oracle R Enterprise Client

To uninstall the Oracle R Enterprise Client Packages and Supporting Packages, start R and type the commands listed in [Example 8-2](#).

Example 8-2 R Commands for Uninstalling Oracle R Enterprise Packages

```
remove.packages("ORE")  
remove.packages("ORExml")  
remove.packages("OREeda")  
remove.packages("OREcommon")  
remove.packages("OREembed")  
remove.packages("OREgraphics")  
remove.packages("OREstats")
```

```
remove.packages("OREbase")
remove.packages("ROracle")
remove.packages("DBI")
remove.packages("png")
remove.packages("OREdm")
remove.packages("OREpredict")
```

8.6 Uninstalling R

To uninstall R, follow the instructions in the following topics:

- [Uninstalling Oracle R Distribution on Windows](#)
- [Uninstalling Oracle R Distribution on Linux](#)
- [Uninstalling Oracle R Distribution on Oracle Solaris](#)
- [Uninstalling Oracle R Distribution on IBM AIX](#)

8.6.1 Uninstalling Oracle R Distribution on Windows

Uninstall Oracle R Distribution just as you would uninstall any other Windows program, using **Programs and Features** in Windows Control Panel.

8.6.2 Uninstalling Oracle R Distribution on Linux

To uninstall Oracle R Distribution on Linux, log in as root and execute these commands in this order. To uninstall a different version of R, replace 3.0.1 with the version number.

Example 8-3 Linux Commands for Uninstalling Oracle R Distribution

Execute these commands as root:

```
rpm -e R-3.0.1
rpm -e R-devel
rpm -e R-core
rpm -e libRmath-devel
rpm -e libRmath
```

8.6.3 Uninstalling Oracle R Distribution on Oracle Solaris

To uninstall Oracle R Distribution on Oracle Solaris, follow the instructions in the readme on the Oracle R Distribution download page on the Oracle Technology Network:

<https://oss.oracle.com/ORD/>

The Oracle R Distribution installation directory on Oracle Solaris includes an uninstall script. Log in as root and run the script as follows:

Example 8-4 Solaris Script for Uninstalling Oracle R Distribution

Execute this script as root:

```
./uninstall.sh
```

8.6.4 Uninstalling Oracle R Distribution on IBM AIX

To uninstall Oracle R Distribution on IBM AIX, follow the instructions in the readme on the Oracle R Distribution download page on the Oracle Technology Network:

<https://oss.oracle.com/ORD/>

Example 8–5 AIX Scripts for Uninstalling Oracle R Distribution

To uninstall all filesets, execute this script as root:

```
./installp -u ORD
```

To uninstall individual filesets, specify their names:

```
installp -u ORD.devel  
installp -u ORD.core
```

A Sample Installation of Oracle R Enterprise

This appendix presents the steps in a typical installation of Oracle R Enterprise on a Linux server and a Windows client. This appendix contains these topics:

- [About the Oracle R Enterprise Sample Installation Environment](#)
- [Installing Oracle R Enterprise on the Server](#)
- [Installing Oracle R Enterprise on the Client](#)
- [Verifying the Oracle R Enterprise Installation](#)

See Also: [Chapter 8](#) for information about uninstalling Oracle R Enterprise

A.1 About the Oracle R Enterprise Sample Installation Environment

About the server computer:

- The server is running Oracle Linux 5.
- The server has access to the internet and to Oracle public yum.
- Oracle Database Enterprise Edition 12.1 is installed on the server.
- Environment variables:
 - `$ORACLE_SID` specifies the identifier (SID) of the database.
 - `$ORACLE_HOME` specifies the home directory of the database.
 - `$LD_LIBRARY_PATH` includes `$ORACLE_HOME/lib`.
 - `$PATH` includes `$ORACLE_HOME/bin`.
- The Linux user ID of the installer:
 - Has sudo rights or root access for installing Oracle R Distribution.
 - Is a member of the dba group for installing and using Oracle R Enterprise.
 - Has write access to `$ORACLE_HOME/lib`.

About the client computer:

- The client is running 64-bit Windows.
- The client has access to the internet.

A.2 Installing Oracle R Enterprise on the Server

To install Oracle R Enterprise on the server computer, first verify that Oracle Database is installed and that the environment is configured as specified in [Section A.1](#). Next, complete these steps in the specified order:

1. [Install Oracle R Distribution](#)
2. [Install Oracle R Enterprise Server](#)
3. [Install the Oracle R Enterprise Supporting Packages on the Server](#)
4. [Create a Database User for Oracle R Enterprise](#)

A.2.1 Install Oracle R Distribution

To install Oracle R Distribution on the server from Oracle public yum, follow these steps:

1. Log in as root and change to `/etc/yum.repos.d`:

```
# cd /etc/yum.repos.d
```
2. List the contents of the directory to determine if the yum configuration file is present. The yum configuration file for Oracle Linux 5 is called `public-yum-el5.repo`.

If `public-yum-el5.repo` is not present, then execute the following command to download it from Oracle public yum:

```
# wget http://public-yum.oracle.com/public-yum-el5.repo
```
3. Open `public-yum-el5.repo` in a text editor and specify `enabled=1` for `latest` and `addons`:

```
[el5_latest]
enabled=1

[el5_addons]
enabled=1
```
4. Install Oracle R Distribution 3.0.1 by executing this command:

```
# yum install R-3.0.1
```

A.2.2 Install Oracle R Enterprise Server

Oracle R Enterprise Server includes the `RQSYS` schema in Oracle Database and Oracle R Enterprise packages and shared libraries. Follow these steps to download and install Oracle R Enterprise Server:

To download Oracle R Enterprise Server:

1. Create an installation directory for the Oracle R Enterprise server components. The directory can have any name. For example:

```
/myhome/myoreserver
```
2. Navigate to the **Oracle R Enterprise Downloads** page on the Oracle Technology Network:

<http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html>

3. Accept the license agreement.
4. Under **Oracle R Enterprise Downloads (v1.4)**, select **Oracle R Enterprise Server Install for Oracle Database on Linux 64 bit (92M)**.
5. Download and unzip the file in the installation directory that you created in Step 1:

```
% cd /myhome/myoreserver
% unzip ore-server-linux-x86-64-1.4.zip
```

6. When you unzip the file, the server subdirectory is created. The contents of the installation directory are listed as follows:

```
% ls
ore-server-linux-x86-64-1.4.zip
server/
```

To install Oracle R Enterprise Server:

1. Change to the server subdirectory:

```
% cd server
```

2. Run the installation script:

```
% ./install.sh
```

3. The installation script prompts you to enter a password and the names of permanent and temporary tablespaces for the RQSYS schema. The default tablespaces are SYSAUX and TEMP. To accept the defaults, press ENTER.

See Also: [Section 4.1.3, "About the Oracle R Enterprise Server Installation Script"](#)

A.2.3 Install the Oracle R Enterprise Supporting Packages on the Server

The Oracle R Enterprise supporting packages are open source R packages that support Oracle R Enterprise. The supporting packages must be installed on both the client and on the server.

To download the Oracle R Enterprise supporting packages:

1. Navigate to the Oracle R Enterprise Downloads page:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```

2. Accept the license agreement.
3. Under **Oracle R Enterprise Downloads (v1.4)**, select **Oracle R Enterprise Supporting Packages for Linux 64-bit Platform (1.2M)**.
4. Download and unzip the file in the installation directory that you created in [Section A.2.2](#):

```
% cd /myhome/myoreserver
% unzip ore-supporting-linux-x86-64-1.4.zip
```

5. When you unzip the file, the supporting subdirectory is created. The contents of the installation are listed as follows:

```
% ls
ore-server-linux-x86-64-1.4.zip
ore-supporting-linux-x86-64-1.4.zip
```

```
server/  
supporting/
```

The supporting subdirectory is populated with the following packages:

```
cairo_1.5-5  
DBI_0.2-7  
png_0.1-7.zip  
ROracle_1.1-11.zip
```

To install the Oracle R Enterprise supporting packages:

1. Change to the supporting subdirectory and list the contents:

```
% cd supporting  
% ls  
cairo_1.5-5_R_x86_64-unknown-linux-gnu.tar.gz  
DBI_0.2-7_R_x86_64-unknown-linux-gnu.tar.gz  
png_0.1-7_R_x86_64-unknown-linux-gnu.tar.gz  
ROracle_1.1-11_R_x86_64-unknown-linux-gnu.tar.gz
```

2. Install the packages in this order:

```
ORE CMD INSTALL ROracle_1.1-11_R_x86_64-unknown-linux-gnu.tar.gz  
ORE CMD INSTALL DBI_0.2-7_R_x86_64-unknown-linux-gnu.tar.gz  
ORE CMD INSTALL png_0.1-7_R_x86_64-unknown-linux-gnu.tar.gz  
ORE CMD INSTALL cairo_1.5-5_R_x86_64-unknown-linux-gnu.tar.gz
```

The packages are installed in `$ORACLE_HOME/R/library`.

A.2.4 Create a Database User for Oracle R Enterprise

Follow these steps to create a database user for Oracle R Enterprise:

1. Change to the Oracle R Enterprise `server` subdirectory:

```
% cd /myhome/myoreserver/server/
```

2. Run the `demo_user` script:

```
% ./demo_user.sh
```

3. The script verifies the environment then displays the following:

```
Do you wish to create an ORE user? [yes]
```

Type `yes` or press `Enter` to create a new user for Oracle R Enterprise.

Type `no` if you want to enable an existing user for Oracle R Enterprise.

4. To create a new user, specify a user name and password. The default user name is `rquser`.

- Provide the permanent tablespace for the user. The default is `USERS`.
- Provide the temporary tablespace for the user. The default is `TEMP`.

To modify an existing user, type the user name.

5. When the script completes, start `SQL*Plus` as `sysdba` and grant the user privileges that are required by Oracle R Enterprise. For the user `rquser`:

```
sqlplus / AS SYSDBA  
GRANT CREATE TABLE TO RQUSER;  
GRANT CREATE PROCEDURE TO RQUSER;
```

```
GRANT CREATE VIEW TO RUSER;
GRANT CREATE MINING MODEL TO RUSER;
GRANT RQADMIN to RUSER;
GRANT UNLIMITED TABLESPACE TO RUSER;
EXIT;
```

A.3 Installing Oracle R Enterprise on the Client

To install Oracle R Enterprise on the client computer, first verify that the Windows environment meets the requirements specified in [Section A.1](#). Next, complete these steps:

- [Install Oracle R Distribution on the Windows Client](#)
- [Install Oracle Instant Client](#)
- [Install the Oracle R Enterprise Client Packages](#)
- [Install the Oracle R Enterprise Supporting Packages](#)

A.3.1 Install Oracle R Distribution on the Windows Client

Before installing Oracle R Distribution, verify that your version of Microsoft Windows is supported by Oracle R Enterprise. Refer to [Table 1–1, "Oracle R Enterprise Platform Requirements"](#).

Follow these steps to install Oracle R Distribution on Windows:

1. Go to the Oracle Open Source Software Download page for Oracle R Distribution:
<https://oss.oracle.com/ORD/>
2. Under **R 3.0.1 Downloads**, select **R Distribution for Windows 64 bit**. Save the file on your computer.
ORE-3.0.1-win.zip
3. When you unzip the file, the executable file is extracted.
ORE-3.0.1-win.exe
4. Double click the executable file to start the installation of Oracle R Distribution.
5. Follow the instructions to complete the installation.

See Also: [Section 8.6.1, "Uninstalling Oracle R Distribution on Windows"](#)

A.3.2 Install Oracle Instant Client

Oracle R Enterprise requires Oracle Database Client. Instead of installing the full Database Client, which must be installed in an Oracle home directory, you can install Oracle Instant Client.

To download and install Oracle Instant Client, follow these steps:

1. Create an installation directory for the Oracle R Enterprise client components. The directory can have any name. For example:
c:\myoreclient

2. Navigate to the Oracle Database Instant Client page on the Oracle Technology Network:
<http://www.oracle.com/technetwork/database/features/instant-client/>
3. Select **See Instant Client Downloads**.
4. On the Instant Client Downloads page, select **Instant Client for Microsoft Windows (x64)**.
5. Accept the license agreement.
6. Under **Version 12.1.0.1.0**, select **Instant Client Package - Basic** or **Instant Client Package - Basic Lite** for Oracle Database 12.1.
7. Save the file in the installation directory that you created in Step 1. For example, if you choose the basic package, the following file is downloaded:

```
c:\myoreclient\instantclient-basic-windows.x64-12.1.0.1.0.zip
```

8. Unzip the file.

When you unzip the file, the `instantclient_12_1` subdirectory is created. The contents of the installation directory are shown as follows:

```
myoreclient
  instantclient_12_1
    vc10
    vc11
```

9. Return to the Instant Client download page:

<http://www.oracle.com/technetwork/topics/winx64soft-089540.html>

10. Accept the license agreement and select **Instant Client Package - SDK**. Save the file in the directory that you created in Step 1.

```
c:\myoreclient\instantclient-sdk-windows.x64-12.1.0.1.0.zip
```

11. Unzip the file.

When you unzip the file, the `sdk` subdirectory is created. The contents of the installation directory are shown as follows:

```
myoreclient
  instantclient_12_1
    help
    sdk
    vc10
    vc11
```

12. Add the full path of the Instant Client to the environment variables `OCI_LIB64` and `PATH`. The following steps set the variables to the path used in this example, `c:\myoreclient\instantclient_12_1`:

1. In Windows Control Panel, choose **System**.
2. Click **Advanced systems settings**.
3. On the **Advanced** tab, click **Environment Variables**.
4. Under **System variables**, create `OCI_LIB64` if it does not already exist. Set the value of `OCI_LIB64` to `c:\oreclient\instantclient_12_1`.
5. Under **System variables**, edit `PATH` to include `c:\oreclient\instantclient_12_1`.

Note: The graphical user interface for creating environment variables may vary slightly, depending on your version of Windows.

A.3.3 Install the Oracle R Enterprise Client Packages

Follow these steps to download and install the Oracle R Enterprise client packages:

To download the Oracle R Enterprise client packages:

1. Navigate to the Oracle R Enterprise Downloads page on the Oracle Technology Network:

<http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html>

2. Accept the License Agreement.
3. Select **Oracle R Enterprise Client Packages for Windows Platform**. Save the file in the installation directory that you created in [Section A.3.2](#).

c:\myoreclient\ore-client-win-x86_64-1.4.zip

4. Unzip the file.

When you unzip the file, the `client` subdirectory is created. The contents of the installation directory are shown as follows:

```
ORE_1.4.zip
OREbase_1.4.zip
OREcommon_1.4.zip
OREdm_1.4.zip
OREeda_1.4.zip
OREembed_1.4.zip
OREgraphics_1.4.zip
OREpredict_1.4.zip
OREstats_1.4.zip
ORExml_1.4.zip
```

To install the Oracle R Enterprise client packages from the R Console:

1. Start R from the Windows Start menu. If you have installed both 32 and 64-bit R, be sure to choose 64-bit R.

The R Console window is displayed, as shown in [Example A-1](#)

2. Install the packages as follows:

```
install.packages("c:/myoreclient/client/ORE_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREbase_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREcommon_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREdm_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREeda_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREembed_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREgraphics_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREpredict_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREstats_1.4.zip", repos=NULL)
install.packages("c:/myoreclient/client/ORExml_1.4.zip", repos=NULL)
```

Each successful package installation produces this message in the R console:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

A.3.4 Install the Oracle R Enterprise Supporting Packages

Follow these steps to download and install the Oracle R Enterprise supporting packages:

To download the Oracle R Enterprise supporting packages:

1. Navigate to the Oracle R Enterprise Downloads page on the Oracle Technology Network:

```
http://www.oracle.com/technetwork/database/options/advanced-analytics/r-enterprise/ore-downloads-1502823.html
```

2. Accept the License Agreement.
3. Select **Oracle R Enterprise Supporting Packages for Windows Platform**. Save the file in the installation directory that you created in [Section A.3.2](#).

```
c:\myoreclient\ore-supporting-win-x86_64-1.4.zip
```

4. Unzip the file.

When you unzip the file, the supporting subdirectory is created. The contents of the installation directory are shown as follows:

```
cairo_1.5-5.zip
DBI_0.2-7.zip
png_0.1-7.zip
ROracle_1.1-11.zip
```

To install the supporting packages from the R Console:

1. Start R from the Windows Start menu. If you have installed both 32 and 64-bit R, be sure to choose 64-bit R.

The R Console window is displayed, as shown in [Example A-1](#).

2. Install the packages as follows:

```
install.packages("c:/myoreclient/supporting/DBI_0.2-7.zip", repos=NULL)
install.packages("c:/myoreclient/supporting/ROracle_1.1-11.zip", repos=NULL)
install.packages("c:/myoreclient/supporting/png_0.1-7.zip", repos=NULL)
install.packages("c:/myoreclient/supporting/cairo_1.5-5.zip", repos=NULL)
```

Each successful package installation produces this message in the R console:

```
package 'package_name' successfully unpacked and MD5 sums checked
```

A.3.4.1 The Oracle R Enterprise Client Installation Directory

The structure of the client installation directory after all the client components have been installed is shown as follows:

```
myoreclient
  client
  instantclient_12_1
  supporting
```

A.4 Verifying the Oracle R Enterprise Installation

To verify that the basic functionality of Oracle R Enterprise is working, establish a connection to Oracle R Enterprise Server, execute several basic commands, and run some of the Oracle R Enterprise demo programs.

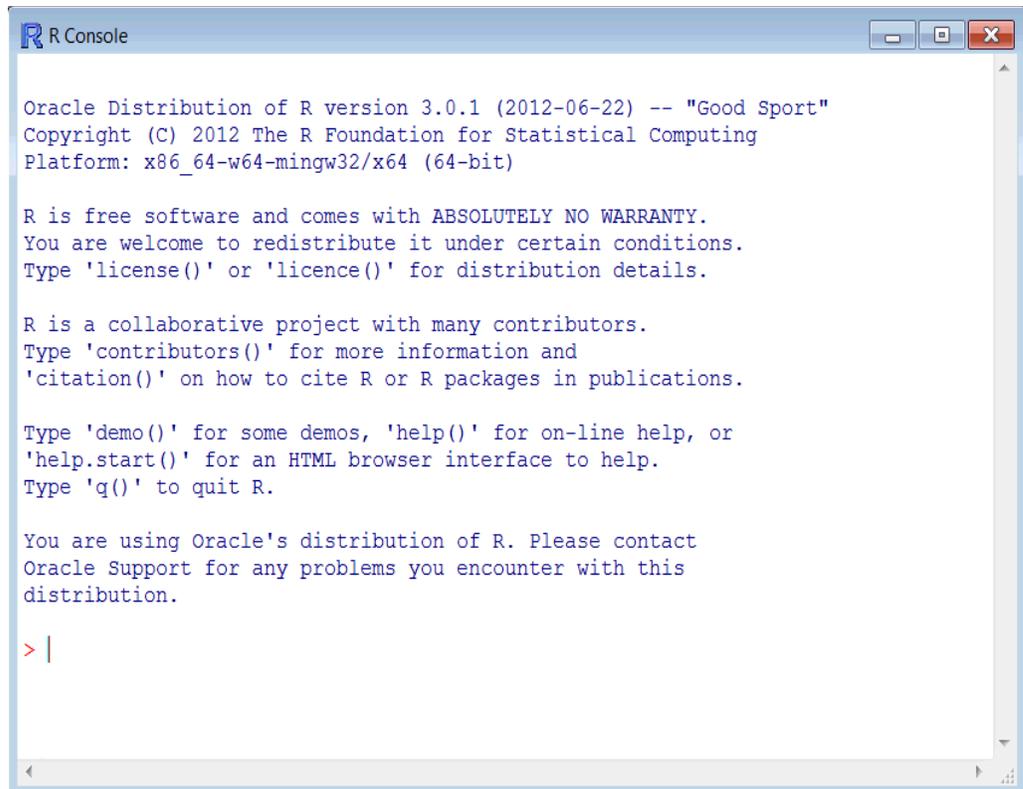
Note: To start and use Oracle R Enterprise, your user ID must have the privileges required for Oracle R Enterprise installation. See Section 4.2.3, "User Requirements" for details.

Example A-1 Connecting to Oracle R Enterprise Server

To connect the Oracle R Enterprise Client to Oracle R Enterprise Server:

1. Select **R x64 3.0.1** from the Windows Start menu.

The R Console is displayed.



```

R Console

Oracle Distribution of R version 3.0.1 (2012-06-22) -- "Good Sport"
Copyright (C) 2012 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

You are using Oracle's distribution of R. Please contact
Oracle Support for any problems you encounter with this
distribution.

> |

```

2. Type this command to start Oracle R Enterprise:

```
> library(ORE)
```

3. Type this command to connect to the Oracle R Enterprise server. The following example connects user `rquser` to the database `orcl` on the server host `serv1` using port 1521:

```
> ore.connect(user="rquser", sid="orcl", host="serv1", password="rquserpsw",
             port=1521, all=TRUE)
```

```
Loading required package: ROracle
Loading required package: DBI
```

4. Execute `ore.is.connected` to validate the connection. If the connection is successful, the command returns `TRUE`:

```
> ore.is.connected()
[1] TRUE
```

Example A–2 Listing the Database Tables Accessible to RUSER

The `ore.ls` command lists the data sets that are available to the current user. For example, if `TABLE1` and `TABLE2` exist in the `ruser` schema:

```
> ore.ls()
[1] "TABLE1" "TABLE2"
```

Example A–3 Pushing an R Data Frame to a Database Table

The `ore.push` command pushes an R data frame to a database table or a database table to an R data frame. For example:

```
> cars <- ore.push(cars)
```

Example A–4 Executing an Embedded R Function

The `ore.doEval` command schedules execution of the specified function in the database-embedded R engine and returns the results.

```
> ore.doEval(function() { 123 })
[1] 123
```

Example A–5 Listing the Oracle R Enterprise Demo Scripts

The Oracle R Enterprise demo scripts are located in `$ORACLE_HOME/R/library/ORE/demo`. The `demo` command provides a list of available demos:

```
> demo(package="ORE")
```

Demos in package 'ORE':

aggregate	Aggregation
analysis	Basic analysis & data processing operations
basic	Basic connectivity to database
binning	Binning logic
columnfns	Column functions
cor	Correlation matrix
crosstab	Frequency cross tabulations
datastore	DataStore operations
datetime	Date/Time operations
derived	Handling of derived columns
distributions	Distribution, density, and quantile functions
do_eval	Embedded R processing
freganalysis	Frequency cross tabulations
glm	Generalized Linear Models
graphics	Demonstrates visual analysis
group_apply	Embedded R processing by group
hypothesis	Hypothesis testing functions
matrix	Matrix related operations
nulls	Handling of NULL in SQL vs. NA in R
odm_ai	Oracle Data Mining: attribute importance
odm_dt	Oracle Data Mining: decision trees
odm_glm	Oracle Data Mining: generalized linear models
odm_kmeans	Oracle Data Mining: enhanced k-means clustering
odm_nb	Oracle Data Mining: naive Bayes classification
odm_svm	Oracle Data Mining: support vector machines
push_pull	RDBMS <-> R data transfer
rank	Attributed-based ranking of observations
reg	Ordinary least squares linear regression
row_apply	Embedded R processing by row chunks
sampling	Random row sampling and partitioning of an <code>ore.frame</code>
sql_like	Mapping of R to SQL commands

stepwise	Stepwise OLS linear regression
summary	Summary functionality
table_apply	Embedded R processing of entire table

A.4.1 Executing Oracle R Enterprise Demo Scripts

You can further verify the success of the installation by running some of the Oracle R Enterprise demo scripts. If a script runs to completion without errors, then the demo is successful.

Example A-6 Executing the aggregate Demo

This example shows the aggregate demo with partial output.

```
> demo("aggregate", package="ORE")

      demo(aggregate)
      ---- ~~~~~

Type <Return> to start :

> #
> #   O R A C L E R E N T E R P R I S E   S A M P L E   L I B R A R Y
> #
> #   Name: aggregate.R
> #   Description: Demonstrates aggregations
> #   See also summary.R
> #
> #
> #
> ## Set page width
> options(width = 80)

> # Push the built-in iris data frame to the database
> IRIS_TABLE <- ore.push(iris)

> # Display the class of IRIS_TABLE
> class(IRIS_TABLE)
[1] "ore.frame"
attr(,"package")
[1] "OREbase"

> # Select count(Petal.Length) group by species
> x = aggregate(IRIS_TABLE$Petal.Length,
+              by = list(species = IRIS_TABLE$Species),
+              FUN = length)

> class(x)
[1] "ore.frame"
attr(,"package")
[1] "OREbase"
.
.
.
.
```

Example A-7 Executing the row_apply Demo

This example shows the row_apply demo with partial output.

```

> demo("row_apply", package="ORE")

      demo(row_apply)
      ---- ~~~~~

Type <Return> to start :

> #
> #   O R A C L E R   E N T E R P R I S E   S A M P L E   L I B R A R Y
> #
> #   Name: row_apply.R
> #   Description: Execute R code on each row
> #
> #
>
> ## Set page width
> options(width = 80)

> # Push the built-in iris data frame to the database
> IRIS_TABLE <- ore.push(iris)

> # Display the class of IRIS_TABLE
> class(IRIS_TABLE)
[1] "ore.frame"
attr(,"package")
[1] "OREbase"

> # Apply given R function to each row
> ore.rowApply(IRIS_TABLE,
+             function(dat) {
+                 # Any R code goes here. Operates on one row of IRIS_TABLE at
+                 # a time
+                 cbind(dat, dat$Petal.Length)
+             })
$`1`
  Sepal.Length Sepal.Width Petal.Length Petal.Width  Species dat$Petal.Length
1           6.4           2.8           5.6           2.1 virginica           5.6

$`2`
  Sepal.Length Sepal.Width Petal.Length Petal.Width  Species dat$Petal.Length
1           7.2            3           5.8           1.6 virginica           5.8

$`3`
  Sepal.Length Sepal.Width Petal.Length Petal.Width  Species dat$Petal.Length
1           7.4           2.8           6.1           1.9 virginica           6.1

$`4`
  Sepal.Length Sepal.Width Petal.Length Petal.Width  Species dat$Petal.Length
1           7.9           3.8           6.4            2 virginica           6.4

$`5`
  Sepal.Length Sepal.Width Petal.Length Petal.Width  Species dat$Petal.Length
1           6.4           2.8           5.6           2.2 virginica           5.6

$`6`
.
.
.
.

```

Example A-8 Executing the cor Demo

This example shows the cor demo with partial output.

```
> demo ("cor")

      demo(cor)
      ---- ~~~

Type <Return> to start :

> #
> #   O R A C L E  R  E N T E R P R I S E  S A M P L E  L I B R A R Y
> #
> #   Name: cor.R
> #   Description: Correlation matrix
> #
> #
> #
> ## Set page width
> options(width = 80)

> # Push the built-in iris data frame to the database
> IRIS_TABLE <- ore.push(iris)

> # Display the class of IRIS_TABLE
> class(IRIS_TABLE)
[1] "ore.frame"
attr(,"package")
[1] "OREbase"

> # Remove non numeric columns
> iris_numeric = IRIS_TABLE[, c("Sepal.Length", "Sepal.Width",
+                               "Petal.Length", "Petal.Width")]

> # Pearson's correlation matrix
> cor(iris_numeric, use = "all.obs")
              Sepal.Length Sepal.Width Petal.Length Petal.Width
Sepal.Length  1.0000000   -0.1175698    0.8717538    0.8179411
Sepal.Width   -0.1175698    1.0000000   -0.4284401   -0.3661259
Petal.Length  0.8717538   -0.4284401    1.0000000    0.9628654
Petal.Width   0.8179411   -0.3661259    0.9628654    1.0000000
.
.
.
.
```

Warning messages:

```
1: ORE object has no unique key - using random order
2: ORE object has no unique key - using random order
3: ORE object has no unique key - using random order
4: ORE object has no unique key - using random order
```

Example A-9 Executing the stepwise Demo

This example shows the stepwise demo with partial output.

```
> demo("stepwise")

      demo(stepwise)
      ---- ~~~~~
```

```

Type <Return> to start :

> #
> #   O R A C L E   R   E N T E R P R I S E   S A M P L E   L I B R A R Y
> #
> #   Name: stepwise.R
> #   Description: STEPWISE Multivariate Regression
> #
> #
> #
> ## Set page width
> options(width = 80)

> # Push the built-in iris data frame to the database
> IRIS_TABLE <- ore.push(iris)

> # Display the class of IRIS_TABLE
> class(IRIS_TABLE)
[1] "ore.frame"
attr(,"package")
[1] "OREbase"

> # Let us first project out the non numeric columns
> IRIS_TABLE = IRIS_TABLE[, c("Sepal.Length", "Sepal.Width",
+                             "Petal.Length", "Petal.Width")]

> # Predict Sepal.Length based on the other 3 numeric columns
> # Do it stepwise
> model = ore.lm(Sepal.Length ~ ., data = IRIS_TABLE)

> model

Call:
ore.lm(formula = Sepal.Length ~ ., data = IRIS_TABLE)

Coefficients:
(Intercept)  Sepal.Width  Petal.Length  Petal.Width
      1.8560         0.6508         0.7091        -0.5565
.
.
.

```

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This appendix contains these topics:

- [Licensing for Open Source R](#)
- [Licensing for Oracle R Distribution](#)
- [Licensing for ROracle](#)

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Since mid-1997 there has been a core group with write access to the R source, currently consisting of:

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John Chambers
Peter Dalgaard
Seth Falcon
Robert Gentleman
Kurt Hornik
Stefano Iacus
Ross Ihaka
Friedrich Leisch
Uwe Ligges
Thomas Lumley
Martin Maechler
Duncan Murdoch
Paul Murrell
Martyn Plummer
Brian Ripley
Deepayan Sarkar
Duncan Temple Lang
Luke Tierney
Simon Urbanek

plus Heiner Schwarte up to October 1999 and Guido Masarotto up to June 2003.

For more information go to <http://www.r-project.org>.

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B.1.4 unzip.h -- IO for uncompress .zip files using zlib

Version 1.01e, February 12th, 2005

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This unzip package allow extract file from .ZIP file, compatible with PKZip 2.04g WinZip, InfoZip tools and compatible.

Multi volume ZipFile (span) are not supported.

Encryption compatible with pkzip 2.04g only supported

Old compressions used by old PKZip 1.x are not supported

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February 1999

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That's all there is to it!

Oracle R Distribution Packages

This appendix lists the packages supported by Oracle R Distribution.

See Also:

- [Section 6.1.3.1](#) for a list of the packages supported by Oracle R Enterprise
- [Section 6.1.3.2](#) for a list of the open source packages that ship with Oracle R Enterprise

C.1 Packages in Oracle R Distribution

[Table C–1](#) lists the packages in Oracle R Distribution that are used by Oracle R Enterprise.

Table C–1 *Packages in Oracle R Distribution Used by Oracle R Enterprise*

Package Name	Package Description
base	The R Base Package
boot	Bootstrap Functions (originally by Angelo Canty for S)
class	Functions for Classification
cluster	Cluster Analysis Extended Rousseeuw et al
codetools	Code Analysis Tools for R
compiler	The R Compiler Package
datasets	The R Datasets Package
foreign	Read Data Stored by Minitab, S, SAS, SPSS, Stata, Systat, dBase, ..
graphics	The R Graphics Package
grDevices	The R Graphics Devices and Support for Colours and Fonts
grid	The Grid Graphics Package
KernSmooth	Functions for kernel smoothing for Wand & Jones (1995)
lattice	Lattice Graphics
MASS	Support Functions and Datasets for Venables and Ripley's MASS
Matrix	Sparse and Dense Matrix Classes and Methods
methods	Formal Methods and Classes
mgcv	GAMs with GCV/AIC/REML smoothness estimation and GAMMs by PQL
nlme	Linear and Nonlinear Mixed Effects Models

Table C-1 (Cont.) Packages in Oracle R Distribution Used by Oracle R Enterprise

Package Name	Package Description
nnet	Feed-forward Neural Networks and Multinomial Log-Linear Models
parallel	Support for parallel computation, including random-number generation
rpart	Recursive Partitioning
spatial	Functions for Kriging and Point Pattern Analysis
splines	Regression Spline Functions and Classes
stats	The R Stats Package
stats4	Statistical Functions using S4 Classes
survival	Survival analysis, including penalised likelihood.
tcltk	Tcl/Tk Interface
tools	Tools for Package Development
translation	Bindings for the Google Translate API v2
utils	The R Utils Package

Installing RStudio

This appendix provides tips for installing RStudio Server for use with Oracle R Enterprise on Linux. This appendix includes these topics:

- [About RStudio](#)
- [Installing RStudio Server](#)
- [Installing RStudio Desktop](#)

D.1 About RStudio

RStudio is a free, open source Integrated Development Environment (IDE) for R. RStudio is available under GNU Affero General Public License (AGPL). You can use RStudio with Oracle R Enterprise, however RStudio is not included with Oracle R Enterprise. If you want to use RStudio, you must install and license it separately.

See Also:

- <http://www.gnu.org/licenses/agpl-3.0-standalone.html> for details about AGPL
- <http://www.rstudio.com/> for details about RStudio

D.2 Installing RStudio Server

RStudio Server is a Linux application that provides a web-based interface to R on a server.

To install RStudio Server for use with Oracle R Enterprise:

1. Download RStudio to your Linux system from the RStudio web site:

```
http://www.rstudio.com/ide/
```

2. Edit the configuration file `rserver.conf`. Supply the values of `RHOME` and `ORACLE_HOME`.

```
% sudo vi /etc/rstudio/rserver.conf
rsession-ld-library-path=RHOME:ORACLE_HOME
```

3. Edit the configuration file `Renviron`. Supply the values of `ORACLE_HOME`, `ORACLE_HOSTNAME`, and `ORACLE_SID`. For example, using the BASH shell:

```
% cd /home/oracle
% sudo vi .Renviron
ORACLE_HOME=ORACLE_HOME
ORACLE_HOSTNAME=ORACLE_HOSTNAME
```

```
ORACLE_SID=ORACLE_SID

# export ORACLE_HOME
# export ORACLE_HOSTNAME
# export ORACLE_SID
```

See Also:

<http://www.rstudio.com/ide/docs/server/configuration>

D.3 Installing RStudio Desktop

RStudio Desktop is an IDE for standalone machines.

To install RStudio Desktop:

1. Install R.
2. Download RStudio Desktop from the RStudio web site:
<http://www.rstudio.com/ide/>
3. Run the installer and follow the prompts.
4. Click the desktop icon to initialize RStudio.

C

CDB, 2-1
client packages
 described, 1-3, 6-2
 installing on Linux or UNIX, 6-10
 installing on Windows, 6-6, A-7
 on the server, 4-2

D

database
 configuring extproc, 2-2
 connecting to, 7-3
 installing, 2-1
 patching, 2-1
 requirements, 1-5, 2-1
database user
 creating, 7-1, A-4
 granting privileges to, 7-2, A-4
 RQADMIN role, 7-2
 RQUSER, 7-2
dba group, 7-1, A-1
DCLI, 5-1
demo scripts
 See example scripts
Distributed Command Line Interface, 5-1

E

embedded R execution, 1-3, A-10
environment variables
 creating on Windows, 4-3
Exadata, 5-1
example scripts, 7-3, A-10
extproc, 2-2

I

IBM AIX
 requirements, 1-5
installing
 example, A-1
 overview, 1-3
 user requirements for, 4-5, A-1
 verifying, 4-9, 7-3, A-8
Instant Client, 6-2, A-5

installing on Windows, 6-3, 6-4

L

LD_LIBRARY_PATH, A-1
Linux
 requirements, 1-5

M

Math Kernel Library, 3-10
Microsoft Windows
 requirements, 1-5
migrating Oracle R Enterprise data, 8-3
multitenant container database, 2-1

O

ora_dba group, 7-1
Oracle Call Interface, 6-1
Oracle Database
 configuring extproc, 2-2
 installing, 2-1
 multitenant container database, 2-1
 patching, 2-1
 requirements, 1-5, 2-1
Oracle Database Client, 6-1, A-5
Oracle Database Instant Client, 6-2, A-5
Oracle Linux
 requirements, 1-5
Oracle public yum, A-2
Oracle R Distribution
 installing, A-2
 overview, 1-2, 3-1
 requirements, 1-5
Oracle R Distribution"installing on Exadata with
 DCLI, 5-3
Oracle R Enterprise
 client components, 1-3, 6-1
 creating a user for, 7-1, A-4
 example scripts, 7-3
 installing, 1-3, 4-1, 6-1
 installing on Exadata, 5-1
 overview, 1-1
 server components, 1-3, 4-1
 system requirements, 1-4

- upgrading, 8-3
- versions, 1-5
- Oracle R Enterprise Client
 - installing, A-5
 - requirements, A-1
- Oracle R Enterprise Server
 - environment variables, 4-3
 - installing, 4-2, A-2
 - installing on Exadata with DCLI, 5-5
 - Linux, 4-6
 - Windows, 4-8
- Oracle Solaris
 - requirements, 1-5
- Oracle Solaris Studio, 3-7
- Oracle Wallet, 8-1
- ORE package, 6-2, A-10
- ore.connect, 7-3, A-9
- OSDBA, 7-1

R

- R
 - installing on Windows, 3-9, A-5
 - memory usage, 8-2
 - open source, 1-1, 3-2, B-1
- Red Hat Enterprise Linux
 - requirements, 1-5
- ROracle package, 1-2, 6-1, 6-2, B-9
- RQSYS, 4-2
- RQUSER, 7-2, A-4
- RStudio, 1-6

S

- SQL transparency, 1-3
- Sun Performance Library, 3-1, 3-7
- supporting packages
 - described, 1-3, 6-2
 - installing on Linux, A-3
 - installing on Linux or UNIX, 6-11
 - installing on Windows, 6-8, A-8
 - on the server, 4-7, 4-9

U

- uninstalling
 - Oracle R Enterprise, 8-4
 - Oracle R Enterprise Client, 8-4
 - Oracle R Enterprise Server, 8-4
 - R, 8-5
- upgrading Oracle R Enterprise, 8-3

Y

- yum, 3-2, A-2