

Oracle® R Enterprise

Installation and Administration Guide

Release 1.4.1 for Windows, Linux, Solaris, and AIX

E57007-08

July 2015

Oracle R Enterprise Installation and Administration Guide, Release 1.4.1 for Windows, Linux, Solaris, and AIX

E57007-08

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Preface

This document explains how to install and administer Oracle R Enterprise Release 1.4.1.

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*

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

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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.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Convention	Meaning
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 Releases 1.4.1 and 1.4.

- [Changes in this Guide for Release 1.4.1](#)
- [Changes in this Guide for Release 1.4](#)

Changes in this Guide for Release 1.4.1

- **Installation and administration of Oracle R Enterprise Server are significantly enhanced.**

A single script, `server.sh` or `server.bat`, performs all administrative operations that affect Oracle R Enterprise Server. You can run the script to install, upgrade, or uninstall the server or to create or configure Oracle R Enterprise users. The script can be run interactively or in batch or hybrid mode.

See Also: [Chapter 4](#) for details

- **The Multitenant Container Database (CDB) feature of Oracle Database 12c is supported.**

You can install support for Oracle R Enterprise Server in a multitenant environment. Oracle R Enterprise Server must be installed in a pluggable database, not in the root database.

See Also:

- *Oracle Database Concepts* for an introduction to multitenant architecture.
- *Oracle Database Administrator's Guide* for information about managing a multitenant environment.

- **Oracle R Enterprise 1.4.1 includes two new supporting packages: `arules` and `statmod`.** The Oracle R Enterprise 1.4.1 supporting packages are:

`arules` 1.1-3
`cairo` 1.5-5
`DBI` 0.2-7
`png` 0.1-7

ROracle 1.1-12
statmod 1.4.20

See Also: [Chapter 6](#) for details about the supporting packages.

- **Oracle R Enterprise supports both R 3.0.1 and R 3.1.1.**
Previously only R 3.0.1 was supported.

Changes in this 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 Microsoft 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 [Table 6–2, "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 EnterpriseSee [Section 6–1, "Oracle R Enterprise 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.
 - **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.
- **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 7.5, "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:

- Oracle R Enterprise Architecture
- Client and Server Components of Oracle R Enterprise
- Oracle R Enterprise Installation Steps
- Oracle R Enterprise System Requirements

1.1 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**

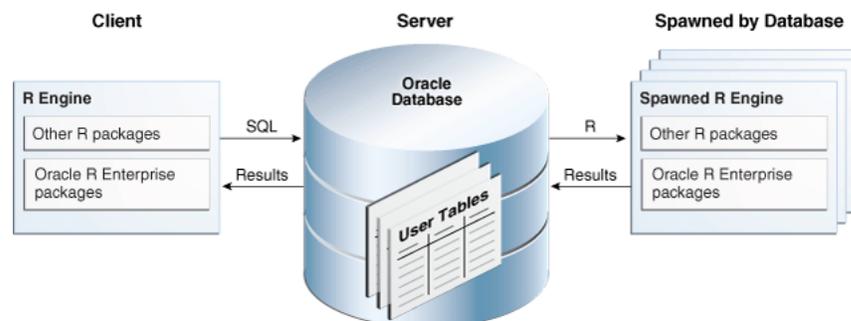
Oracle R Enterprise packages on the client support SQL transparency, which enables Oracle tables to appear "transparently" as native R objects. With SQL transparency, data analysts can use R to explore, cleanse, and transform data without having to know SQL.

- **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 sets, 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*



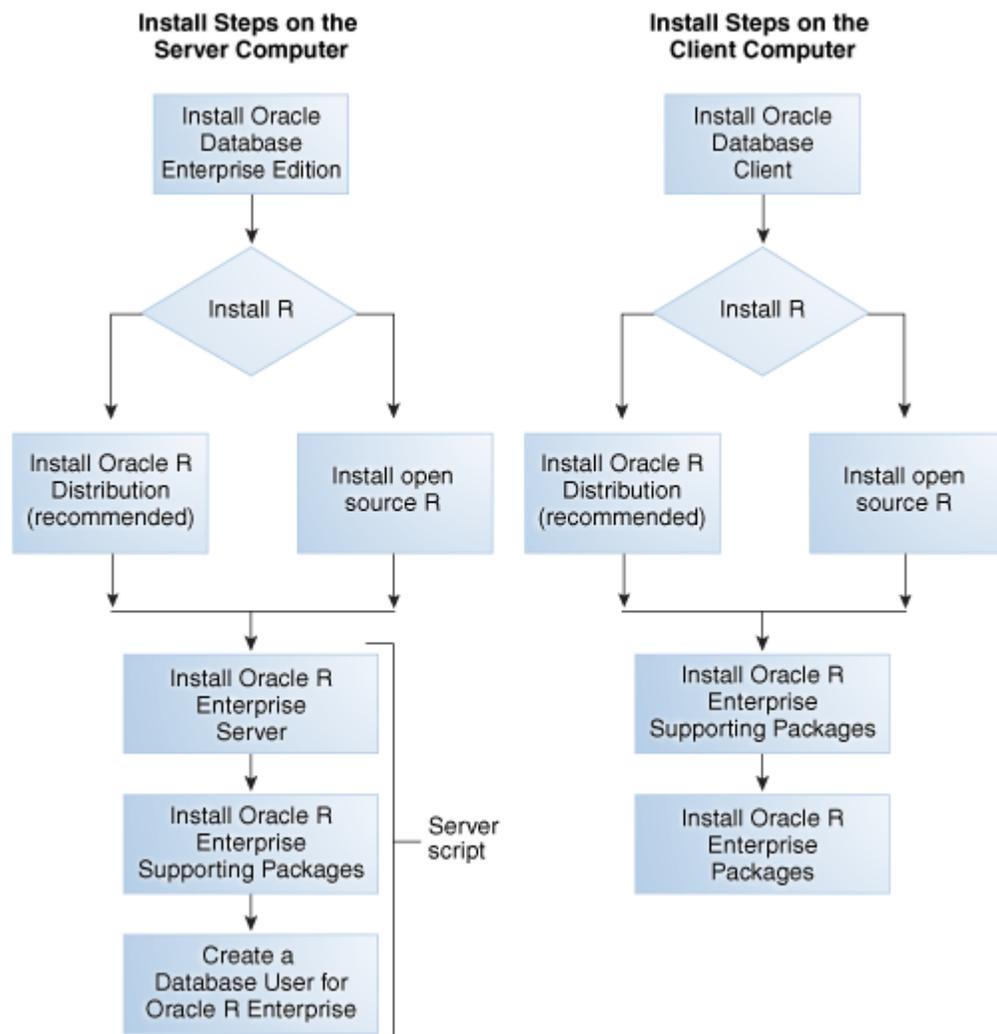
1.2 Client and Server Components of Oracle R Enterprise

- **Oracle R Enterprise Client Components:**
 - Oracle Database Client
 - Oracle R Enterprise packages and supporting 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 packages

1.3 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



The Oracle R Enterprise Server installation script can install the supporting packages and create a database user along with the installation of Oracle R Enterprise Server. See [Chapter 4](#) for details.

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.

1.4 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 See Section 1.4.1, "Verifying 64-Bit Architecture on Microsoft Windows" .

[Table 1–2](#) shows the supported configurations of Oracle R Enterprise server components. Oracle recommends that you use Oracle R Distribution, Oracle's free distribution of R, with Oracle R Enterprise. You should install Oracle R Distribution before installing Oracle R Enterprise.

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, 12.1.0.1
1.1	2.13.2	11.2.0.3, 11.2.0.4, 12.1.0.1
1.2	2.15.1	11.2.0.3, 11.2.0.4, 12.1.0.1
1.3	2.15.1	11.2.0.3, 11.2.0.4, 12.1.0.1
1.3.1	2.15.1, 2.15.2, 2.15.3	11.2.0.3, 11.2.0.4, 12.1.0.1

Table 1–2 (Cont.) Oracle R Enterprise Server Support Matrix

Oracle R Enterprise	Open source R or Oracle R Distribution	Oracle Database (see Note)
1.4	3.0.1, 3.1.1	11.2.0.3, 11.2.0.4, 12.1.0.1
1.4.1	3.0.1, 3.1.1	11.2.0.3, 11.2.0.4, 12.1.0.1

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.

See Also:

- ["Oracle R Distribution and Oracle R Enterprise"](#) on page 3-2.
- *Oracle R Enterprise Release Notes* for the latest platform requirements and the latest versions of R that are supported with Oracle R Enterprise.

1.4.1 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**.

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:

- **Linux**
 - *Oracle Database Installation Guide for Linux, Release 12.1,*
<http://www.oracle.com/pls/topic/lookup?ctx=db121&id=LADBI>
 - *Oracle Database Installation Guide for Linux, Release 11.2,*
<http://www.oracle.com/pls/topic/lookup?ctx=db112&id=LADBI>
- **Oracle Solaris**
 - *Oracle Database Installation Guide for Oracle Solaris, Release 12.1,*
<http://www.oracle.com/pls/topic/lookup?ctx=db121&id=SSDBI>
 - *Oracle Database Installation Guide for Oracle Solaris, Release 11.2,*
<http://www.oracle.com/pls/topic/lookup?ctx=db112&id=SSDBI>
- **IBM AIX**
 - *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit), Release 12.1,*
<http://www.oracle.com/pls/topic/lookup?ctx=db121&id=AXDBI>
 - *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit), Release 11.2,*
<http://www.oracle.com/pls/topic/lookup?ctx=db112&id=AXDBI>
- **Microsoft Windows**
 - *Oracle Database Installation Guide for Microsoft Windows, Release 12.1,*
<http://www.oracle.com/pls/topic/lookup?ctx=db121&id=NTDBI>

- Oracle Database Installation Guide for Microsoft Windows. Release 11.2, <http://www.oracle.com/pls/topic/lookup?ctx=db112&id=NTDBI>

Note: You can install Oracle R Enterprise Server in a pluggable database (PDB) within a multitenant container database (CDB). The database may not be the root database.

For information about managing a multitenant environment, see *Oracle Database Administrator's Guide*.

2.2 Patching an 11.2.0.1 or 11.2.0.2 Database on Linux

Oracle R Enterprise 1.4.1 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 R and Oracle R Enterprise
- 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 Microsoft Windows
- Configuring Oracle R Distribution to Use MKL on the Client
- Uninstalling Oracle R Distribution

See Also: Chapter 5, "Installing Oracle R Enterprise on Exadata"

3.1 About R and Oracle R Enterprise

Oracle R Enterprise requires an installation of R on the server computer and on each client computer that interacts with the server. R is third-party, open source software. Open source R is governed by GNU General Public License (GPL) and not by Oracle licensing.

See Also:

- Table 1–2, "Oracle R Enterprise Server Support Matrix" for the versions of R that are supported with Oracle R Enterprise
- Appendix D, "License Information for Oracle R Enterprise"
- R Project for Statistical Computing at <http://www.r-project.org>

3.1.1 About ROracle

ROracle is an open source R package that enables interaction between R and an Oracle database. ROracle is maintained and supported by Oracle.

ROracle is one of the open source supporting packages that is used by Oracle R Enterprise. The supporting packages are introduced in [Section 1.2](#) and described in [Table 6–2](#).

3.1.2 Oracle R Distribution and Oracle R Enterprise

Oracle recommends that you use **Oracle R Distribution**, Oracle's free distribution of R, with Oracle R Enterprise. Oracle R Distribution offers significant advantages for Oracle R Enterprise.

Why Oracle R Distribution?

- Oracle R Distribution simplifies the installation of R for Oracle R Enterprise.
- Oracle R Distribution is supported by Oracle for customers of Oracle Advanced Analytics, Oracle Linux, and Oracle Big Data Appliance.
- On Windows and Linux, Oracle R Distribution simplifies integration with the **Intel Math Kernel Library** (MKL). 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. (See [Section 3.6, "Configuring Oracle R Distribution to Use MKL on the Client"](#).)
- On Oracle Solaris, Oracle R Distribution automatically uses **Sun Performance Library**. Like MKL for Linux and Windows, Sun Performance Library offers improved performance of many mathematical computations. Sun Performance Library is part of Oracle Solaris Studio.

3.1.3 Open Source R and Oracle R Enterprise

Although Oracle recommends that you use Oracle R Distribution whenever possible, you can use open source R with Oracle R Enterprise. If you choose to use open source R, then you must build it from source. Use the following configuration parameters:

```
./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/>
- [Section 7.4, "Installing Additional R Packages on Linux or UNIX"](#)
- "Using a Third-Party Package on the Client" in *Oracle R Enterprise User's Guide*
- "Installing a Third-Party Package for Use in Embedded R Execution" in *Oracle R Enterprise User's Guide*

3.2 Installing Oracle R Distribution on Linux

You can install Oracle R Distribution on Oracle Linux and on Redhat Enterprise Linux. Before you begin the installation, verify that your Linux version is supported by Oracle R Enterprise, as described in [Table 1-1, "Oracle R Enterprise Platform Requirements"](#). You can use this command to verify the Linux version:

```
# uname -r
```

Note: For Oracle Linux systems that have access to the internet, Oracle recommends installing Oracle R Distribution from the Oracle public yum server at the following URL:

<http://public-yum.oracle.com/>

This topic contains these sections:

- [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](#)

3.2.1 Installing Oracle R Distribution on Oracle Linux Using Yum

Oracle recommends that you use yum to install Oracle R Distribution. Yum simplifies the installation of Oracle R Distribution by automatically resolving RPM dependencies. If you install the RPMs directly as shown in [Section 3.2.2](#), then you must resolve dependencies manually.

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, `o16` for Oracle Linux 6, or `o17`, for Oracle Linux 7.

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-o16.repo
```

or

```
# wget http://public-yum.oracle.com/public-yum-o17.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`, `o16`, or `o17`:

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

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

Also, for Oracle Linux 7 only:

```
[o17_optional_latest]
enabled = 1
```

The location of the Oracle R Distribution packages is specified in `xxx_addons`. The location of the dependencies for the Oracle R Distribution RPMs is specified in `xxx_latest`. For Oracle Linux 7 only, several dependencies are in `optional_latest`.

The URLs for the Oracle R Distribution RPMs in the addons repository are shown in [Example 3-1](#). Specify **3.1.1-2** if *Rversion* is 3.1.1. Specify **3.0.1-2** if *Rversion* is 3.0.1.

Example 3-1 Oracle R Distribution RPMs in addons Repository

Oracle Linux 5:

```
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-Rversion.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-core-Rversion.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-devel-Rversion.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-Rversion.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-devel-Rversion.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-static-Rversion.el5.x86_64.rpm
```

Oracle Linux 6:

```
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-Rversion.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-core-Rversion.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-devel-Rversion.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-Rversion.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-devel-Rversion.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-static-Rversion.el6.x86_64.rpm
```

Oracle Linux 7:

```
http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/getPackage
/R-Rversion.el7.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/getPackage
/R-core-Rversion.el7.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/getPackage
/R-devel-Rversion.el7.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/getPackage
/libRmath-Rversion.el7.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/getPackage
/libRmath-devel-Rversion.el7.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/getPackage
/libRmath-static-Rversion.el7.x86_64.rpm
```

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-el5.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. Specify **3.0.1** or **3.1.1** for *Rversion*

```
# yum install R-Rversion
```

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.

3.2.2 Installing Oracle R Distribution on Oracle Linux Using RPMs

Oracle recommends that you use yum to install Oracle R Distribution, because yum automatically resolves RPM dependencies. However, if yum is not available, then you can install the RPMs directly and resolve the dependencies manually.

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 RPMs for R 3.1.1 and R 3.0.1 are listed in these topics:

- [Oracle R Distribution 3.1.1 RPMs for Oracle Linux 5](#)
- [Oracle R Distribution 3.1.1 RPM Dependencies for Oracle Linux 5](#)
- [Oracle R Distribution 3.1.1 RPMs for Oracle Linux 6](#)

- 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 3.1.1 RPMs for Oracle Linux 5

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

```
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-core-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-devel-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-devel-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-static-3.1.1-2.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 3.1.1 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
avahi-compat-libdns_sd-devel-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
Cairo-devel-1.2.4-5.el5.x86_64.rpm
chkfontpath-1.10.1-1.1.x86_64.rpm
cups-1.3.7-30.el5_9.3.x86_64.rpm
cups-devel-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
e2fsprogs-devel-1.39-36.0.1.el5_9.x86_64.rpm
ed-0.2-39.el5_2.x86_64.rpm
fontconfig-devel-2.4.1-7.el5.x86_64.rpm
freetype-devel-2.2.1-32.el5_9.1.x86_64.rpm
gcc-gfortran-4.1.2-54.el5.x86_64.rpm
gdk-pixbuf-0.22.0-25.el5.x86_64.rpm
gdk-pixbuf-devel-0.22.0-25.el5.x86_64.rpm
ghostscript-8.70-14.el5_8.1.x86_64.rpm
ghostscript-fonts-5.50-13.1.1.noarch.rpm
glib2-devel-2.12.3-4.el5_3.1.x86_64.rpm
gmp-4.1.4-10.el5.x86_64.rpm
gnutls-devel-1.4.1-14.el5_10.x86_64
gtk2-2.10.4-29.el5.x86_64.rpm
gtk+-1.2.10-57.el5.x86_64.rpm
hicolor-icon-theme-0.9-2.1.noarch.rpm
keyutils-libs-devel-1.2-1.el5.x86_64.rpm
krb5-devel-1.6.1-70.el5_9.2.x86_64.rpm
```

```

libfontenc-1.0.2-2.2.el5.x86_64.rpm
libFS-1.0.0-3.1.x86_64.rpm
libgcrypt-devel-1.4.4-7.el5_10.x86_64.rpm
libgfortran-4.1.2-54.el5.x86_64.rpm
libgpg-error-devel-1.4-2.x86_64.rpm
libpng-devel-1.2.10-17.el5_8.x86_64.rpm
libRmath-3.1.1-2.el5.x86_64.rpm
libRmath-devel-3.1.1-2.el5.x86_64.rpm
libselenium-devel-1.33.4-5.7.el5.x86_64.rpm
libsepol-devel-1.15.2-3.el5.x86_64.rpm
libtiff-3.8.2-19.el5_10.x86_64.rpm
libtiff-devel-3.8.2-19.el5_10.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
libXext-devel-1.0.1-2.1.i386.rpm
libXext-devel-1.0.1-2.1.x86_64.rpm
libXfont-1.2.2-1.0.4.el5_7.x86_64.rpm
libXft-devel-2.1.10-1.1.x86_64.rpm
libXrender-devel-0.9.1-3.1.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
pango-devel-1.14.9-8.0.1.el5_7.3.x86_64.rpm
paps-0.6.6-20.el5.x86_64.rpm
pcre-devel-6.6-9.el5.x86_64.rpm
poppler-0.5.4-19.el5.x86_64.rpm
poppler-utils-0.5.4-19.el5_9.2.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-3.0-33.8.el5_5.6.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-xf86-1.0.2-5.el5_6.1.x86_64.rpm
zlib-devel-1.2.3-7.el5.x86_64.rpm

```

3.2.2.3 Oracle R Distribution 3.1.1 RPMs for Oracle Linux 6

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

```

http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-core-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-devel-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-devel-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-static-3.1.1-2.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
```

3.2.2.4 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-3.0.1-2.x86_64.rpm  
R-core-3.0.1-2.x86_64.rpm  
R-devel-3.0.1-2.x86_64.rpm  
libRmath-3.0.1-2.x86_64.rpm  
libRmath-devel-3.0.1-2.x86_64.rpm  
libRmath-static-devel-3.0.1-2.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.

3.2.2.5 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-xf86-1.0.2-5.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

```

3.2.2.6 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
libRmath-static-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

Tip: *Rversion* represents the version of Oracle R Distribution. Replace *Rversion* with **3.1.1-2** for R 3.1.1; replace *Rversion* with **3.0.1-2** for R 3.0.1.

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):

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

3. Download the source RPM (*R-version.el6.src.rpm*) from Oracle public yum.

For Red Hat Enterprise Linux 6:

http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/

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

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

```
rpmbuild --rebuild /rpmbuild/SRPMS/R-Rversion.el6.src.rpm
```

Note:

- Linux 5

The source RPM, *R-3.1.1-2.el5.src.rpm*, is here:

http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/

- Linux 7

The source RPM, *R-3.1.1-2.el7.src.rpm*, is here:

http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/x86_64/

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 these commands to install R:

```
# rpm -i path/rpmbuild/RPMS/R-Rversion-2.el6.x86_64.rpm
# rpm -i path/rpmbuild/RPMS/R-core-Rversion.el6.x86_64.rpm
# rpm -i path/rpmbuild/RPMS/libRmath-Rversion.el6.x86_64.rpm
# rpm -i path/rpmbuild/RPMS/libRmath-devel-Rversion.el6.x86_64.rpm
# rpm -i path/rpmbuild/RPMS/libRmath-static-Rversion.el6.x86_64.rpm
# rpm -i path/rpmbuild/RPMS/R-devel-Rversion.el6.x86_64.rpm
```

For example, this command installs R 3.1.1 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-3.1.1-2.el6.x86_64.rpm
```

3.3 Installing Oracle R Distribution on Oracle Solaris

You can install Oracle R Distribution on Oracle Solaris on Intel and on SPARC platforms. Before you begin the installation, verify that your Oracle Solaris version is supported by Oracle R Enterprise, as described in [Table 1-1, "Oracle R Enterprise Platform Requirements"](#). You can use this command to verify the version of Oracle Solaris:

```
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, where *Rversion* is **3.1.1-2** for R 3.1.1 or **3.0.1-2** for R 3.0.1:
 - For x86 64-bit systems:


```
ord-Rversion-sol110-x86-64-sunstudio12u3.tar.gz
ord-Rversion-supporting-sol110-x86-64-sunstudio12u3.tar.gz
```
 - For SPARC 64-bit systems:


```
ord-Rversion-sol110-sparc-64-sunstudio12u3.tar.gz
ord-Rversion-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
```

3.4 Installing Oracle R Distribution on IBM AIX

Before installing Oracle R Distribution, verify that your version of IBM AIX is supported by Oracle R Enterprise, as described in [Table 1-1, "Oracle R Enterprise Platform Requirements"](#). You can use this command to verify the version of IBM AIX:

```
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, where *Rversion* is **3.1.1.0** for R 3.1.1 or **3.0.1.0** for R 3.0.1:


```
ORD.Rversion.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-Rversion-aix.bft.gz to get ORD-Rversion-aix.bff:

```
$ gunzip ORD.Rversion.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
```

3.5 Installing Oracle R Distribution on Microsoft Windows

Before installing Oracle R Distribution, verify that your version of Microsoft Windows is supported by Oracle R Enterprise, as described in [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. Select R Distribution for Windows 64 bit. Save the zip file on your computer.

```
ORE-Rversion-win.zip
```

3. Unzip the file and extract the executable file.

```
ORE-Rversion-win.exe
```

4. Double click the executable file to start the installation of Oracle R Distribution.
5. Follow the instructions to complete the installation.

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.

This topic contains these sections:

- [Section 3.6.1, "Enabling MKL Support for Oracle R Distribution on a Linux Client"](#)
- [Section 3.6.2, "Enabling MKL Support for Oracle R Distribution on a Windows Client"](#)

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 website:

```
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:

```
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 website:

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

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

2. Add the location of `libOrdBlasLoader.dll` and `mkl_rt.dll` to the `PATH` system environment variable. For instructions, see.

Note: In a typical installation of Oracle R Distribution 3.1.1, `libOrdBlasLoader.dll` is located in the R home directory:

```
C:\Program Files\R\R-3.1.1\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:

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
```

3.7 Uninstalling Oracle R Distribution

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

- [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](#)

3.7.1 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.

3.7.2 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 3.1.1 with the version number.

Example 3–2 Linux Commands for Uninstalling Oracle R Distribution

Execute the following commands as root. Specify the version of R for *Rversion*, for example 3.1.1 or 3.0.1.

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

3.7.3 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 3–3 Solaris Script for Uninstalling Oracle R Distribution

Execute this script as root:

```
./uninstall.sh
```

3.7.4 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 3–4 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
```

Installing Oracle R Enterprise Server

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

- About Oracle R Enterprise Server
- About the SERVER Script
- Oracle R Enterprise Server Requirements
- Installing Oracle R Enterprise Server
- Verifying the Oracle R Enterprise Server Installation
- Installing Oracle R Enterprise Server in a Multitenant Environment

See Also:

- Section 7.1, "Upgrading Oracle R Enterprise"
- Section 7.3, "Uninstalling Oracle R Enterprise"
- Chapter 5, "Installing Oracle R Enterprise on Exadata"
- Appendix A, "A Sample Installation of Oracle R Enterprise"

4.1 About Oracle R Enterprise Server

Oracle R Enterprise includes several components on the server. Together these components enable an Oracle R Enterprise client to interact with Oracle R Enterprise Server.

The server-side components of Oracle R Enterprise are:

- Oracle Database Enterprise Edition
- Oracle R Distribution or open source R
- Oracle R Enterprise Server

Oracle R Enterprise Server consists of the following:

- The `rgsys` schema, described in Section 4.1.1, "About the RQSYS Schema"
- Metadata and executable code in `sys`
- Oracle R Enterprise Server libraries in `$ORACLE_HOME/lib` (Linux and UNIX) or `%ORACLE_HOME%\bin` (Windows)
- Oracle R Enterprise R packages in `$ORACLE_HOME/R/library` (`%ORACLE_HOME%\R\library` on Windows)

The Oracle R Enterprise packages and supporting packages on the server support embedded R execution. These same packages must be installed separately on each client computer. (See [Section 6.1.2, "About the Oracle R Enterprise Packages"](#)).

See Also: [Figure 1–2](#) for an illustration of the server and client components of Oracle R Enterprise.

4.1.1 About the RQSYS Schema

The `rqsys` schema is the system account for Oracle R Enterprise in Oracle Database. It contains metadata, PL/SQL packages, and other executable code that is used internally by Oracle R Enterprise Server.

The Oracle R Enterprise Server installation process creates `rqsys` as a locked account with an expired password. The `rqsys` user does not have the `CREATE SESSION` privilege.

4.2 About the SERVER Script

A single script called `server` manages the installation and administration of Oracle R Enterprise Server. You can rerun the `server` script whenever you need to install, uninstall, upgrade, or configure server-side components of Oracle R Enterprise.

4.2.1 Overview of SERVER Operations

The `server` script supports the following operations:

- Installs Oracle R Enterprise Server
- Uninstalls Oracle R Enterprise Server
- Upgrades Oracle R Enterprise Server and migrates data from the earlier installation
- Installs the supporting packages, if they are available
- Creates or configures a database user, if one does not exist

Note: You can use the `server` script to install the supporting packages and create users, or you can choose to perform these tasks separately, as described in the following sections:

- [Section 6.4, "Installing the Oracle R Enterprise Supporting Packages"](#)
 - [Section 7.5, "Creating a Database User for Oracle R Enterprise"](#)
-
-

4.2.2 SERVER Syntax

The `server` script supports a set of command-line arguments that direct its activities. The script can be run in interactive mode, in batch mode, or in hybrid mode. If you run the script without arguments, it installs or upgrades Oracle R Enterprise Server in interactive mode; it attempts to install the supporting packages; and it creates or configures a database user.

The command-line arguments for the `server` script are described in [Table 4–1](#). The arguments for the script are the same for Linux, UNIX, and Windows. You can obtain a

listing of the arguments with brief descriptions by executing the following on a Linux or UNIX system:

```
./server.sh -h
or
./server.sh --help
```

On a Windows system, you can obtain a listing of the arguments with brief descriptions by executing the following:

```
server.bat -h
or
server.bat --help
```

Table 4–1 *SERVER Script Command-Line Arguments*

Argument	Description
-y	Never prompt.
-i, --install	Install or upgrade Oracle R Enterprise Server. An installation or upgrade includes the following by default: <ul style="list-style-type: none"> ■ Installation of the supporting packages, if they are present. ■ Creation or configuration of a database user, if one does not exist.
-u, --uninstall	Uninstall Oracle R Enterprise Server: <ul style="list-style-type: none"> ■ When used with <code>--keep</code> (the default), the script removes the <code>rqsys</code> metadata and PL/SQL packages from the database but retains the libraries and R packages under Oracle home (partial uninstall). ■ When used with <code>--full</code>, the script removes the libraries and R packages under Oracle home in addition to the <code>rqsys</code> metadata and PL/SQL packages in the database. (full uninstall). See Section 7.3, "Uninstalling Oracle R Enterprise" .
-s, --setup-user	Create or configure a database user for Oracle R Enterprise (the default).
--keep	When uninstalling Oracle R Enterprise Server, keep the R packages and libraries under Oracle home but remove the database objects. Allows Oracle R Enterprise support to be removed from a single database instance or pluggable database (PDB) without affecting other databases in Oracle home. See Section 7.3.1.1, "Performing a Partial Uninstall" .
--full	When uninstalling Oracle R Enterprise Server, remove the R packages and libraries under Oracle home in addition to the database objects. See Section 7.3.1.2, "Performing a Full Uninstall" .
--no-supp	When combined with <code>--install</code> , prevents installation of the supporting packages. By default the supporting packages are installed if they are available.
--no-user	When combined with <code>--install</code> , prevents the creation of an Oracle R Enterprise user. By default a user is created if one does not already exist.
--admin	Grant the <code>rqadmin</code> role to the Oracle R Enterprise user. By default, the <code>rqadmin</code> role is <i>not</i> granted. The <code>--admin</code> option should be used with caution. It is only available in batch mode. See Section 7.5.1, "About the RQADMIN Role" .
--sys PASSWORD	sys password. The <code>sys</code> password is not required if the script is running under operating system authentication, as described in Section 4.3.3.1, "About Operating System Authentication" .

Table 4–1 (Cont.) SERVER Script Command-Line Arguments

Argument	Description
--pdb NAME	The name of a pluggable database (PDB) in a multitenant container database (CDB). Multitenant architecture enables an Oracle database to function as a container database that includes zero, one, or many pluggable databases. For information about multitenant architecture, see <i>Oracle Database Concepts</i> .
--perm PERM	Permanent tablespace for rqsys.
--temp TEMP	Temporary tablespace for rqsys.
--rqsys PASSWORD	rqsys password. See Section 4.1.1, "About the RQSYS Schema".
--user-perm PERM	Permanent tablespace for Oracle R Enterprise user.
--user-temp TEMP	Temporary tablespace for Oracle R Enterprise user.
--pass PASSWORD	Oracle R Enterprise user password.
--user USER	Oracle R Enterprise database user name.

4.2.3 SERVER Examples

This topic provides these examples:

- [A Default Interactive Installation](#)
- [A Default Batch Installation](#)
- [User Configuration in Interactive Mode](#)
- [User Configuration in Batch Mode](#)

See Also: [Example A–1, "A Default, First-Time Installation of Oracle R Enterprise Server"](#) for an example with output.

4.2.3.1 A Default Interactive Installation

If your Linux or UNIX or Windows system meets the requirements specified in [Section 4.3.1](#), then this command performs a default, first-time installation of Oracle R Enterprise Server:

For Linux or UNIX:

```
./server.sh
```

For Windows:

```
server.bat
```

As shown in [Example A–1](#), a default, interactive installation performs the following:

- Prints out information about the environment
- Prompts for the password and permanent and temporary tablespaces for rqsys
- Prompts whether to install the supporting packages. (Installs the supporting packages by default if they are available.)
- Prompts whether to create a user account for Oracle R Enterprise. (Creates a user by default if one does not exist.) When creating a user, prompts for the permanent and temporary tablespaces.

4.2.3.2 A Default Batch Installation

This example shows an installation like the one in [Section 4.2.3.1](#), but specified to run in batch mode.

For Linux or UNIX:

```
./server.sh -y --install --setup-user --sys ORASYSPSWD,
--perm SYSAUX --temp TEMP --rqsys RQSYSPSWD
--user-perm USERS --user-temp TEMP --pass RQUSERPSWD --user RQUSER
```

For Windows:

```
server.bat -y --install --setup-user --sys ORASYSPSWD,
--perm SYSAUX --temp TEMP --rqsys RQSYSPSWD
--user-perm USERS --user-temp TEMP --pass RQUSERPSWD --user RQUSER
```

4.2.3.3 User Configuration in Interactive Mode

The `server` script automatically creates or configures a user if one does not already exist. If you supply the name of an existing user, the script configures it to support Oracle R Enterprise.

See [Example 7-2, "Creating an Oracle R Enterprise User"](#).

4.2.3.4 User Configuration in Batch Mode

This example shows how the `server` script could be run to grant the `rqadmin` role to the user created in [Section 4.2.3.2](#). The `--admin` argument is only available in batch mode.

For Linux or UNIX:

```
./server.sh -y --setup-user --admin --sys ORASYSPSWD -
-pass RQUSERPSWD --user RQUSER
```

For Windows:

```
server.bat -y --setup-user --admin --sys ORASYSPSWD -
-pass RQUSERPSWD --user RQUSER
```

See [Section 7.5.1, "About the RQADMIN Role"](#).

4.3 Oracle R Enterprise Server Requirements

Before installing Oracle R Enterprise Server, verify your system environment, and ensure that your user ID has the proper permissions.

4.3.1 System Requirements

- The operating system must conform to the requirements specified in [Section 1.4](#).
- Oracle Database must be installed and configured as described in [Chapter 2](#).

Note: You can install Oracle R Enterprise Server in a pluggable database (PDB) in a multitenant environment. See *Oracle Database Administrator's Guide*

- R must be installed as described in [Chapter 3](#).

4.3.2 Environment Variables

Table 4–2 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> <p>On Windows, you can find the value of Oracle home and the Oracle instance identifier in the Windows Registry. If more than one Oracle home or Oracle instance exist on this computer, then you can specify the required values in environment variables. See Section 7.6, "Creating and Modifying Environment Variables on Windows".</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 %R_HOME%\bin\x64. The default value of %R_HOME% is C:\Program Files\R\R-3.1.1.</p> <p>You can find the value of the R home directory in the Windows Registry. If more than one R home exist on this computer, then you can specify the required value in an environment variable. See Section 7.6, "Creating and Modifying Environment Variables on Windows".</p>

4.3.3 User Requirements

The operating system user that installs Oracle R Enterprise Server must meet the requirements described in [Table 4–3](#).

Table 4–3 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%\bin

4.3.3.1 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*

4.3.3.2 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`.

4.4 Installing Oracle R Enterprise Server

To install Oracle R Enterprise Server:

1. Ensure that your system satisfies the requirements specified in [Section 4.3](#).
2. Create an installation directory for the Oracle R Enterprise server components. The directory can have any name. For example:

```
/oreserver_install_dir
```

3. Download the Oracle R Enterprise Server installation files and supporting packages from 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
```

- a. Accept the license agreement and download the Oracle R Enterprise **Server** files for your platform to your installation directory.

- b. Accept the license agreement and download the Oracle R Enterprise **Supporting** packages for your platform to your installation directory.

The installation directory now contains two zip files.

```
ore-server-platform-arch-1.4.1.zip
ore-supporting-platform-arch-1.4.1.zip
```

4. Unzip the files.

```
unzip ore-server-platform-arch-1.4.1.zip
unzip ore-supporting-platform-arch-1.4.1.zip
```

The installation directory looks like this after you unzip both files:

For Linux or UNIX:

```
/oreserver_install_dir
  ore-server-platform-arch-1.4.1.zip
  ore-supporting-platform-arch-1.4.1.zip
  server.sh
  /server
  /supporting
```

For Windows:

```
\oreserver_install_dir
  ore-server-platform-arch-1.4.1.zip
  ore-supporting-platform-arch-1.4.1.zip
  server.bat
  \server
  \supporting
```

5. For Linux or UNIX, run `server.sh`. For Windows, run `server.bat`. The script performs a default, first-time installation of Oracle R Enterprise Server, as described in [Section 4.2.3.1](#).

For Linux or UNIX:

```
./server.sh
```

For Windows:

```
server.bat
```

See Also: [Example A-1, "A Default, First-Time Installation of Oracle R Enterprise Server"](#) for an example with output.

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
outcdb.log  rqconfig.log  rqdrop.log  rqgrant.log  rqinst.log  rqpdrp.log
rqproc.log  rquser.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

4.5.1 Validating Basic Oracle R Enterprise Functionality

After connecting as described in [Section 6.5](#), 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 })
```

4.5.2 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()
```

4.6 Installing Oracle R Enterprise Server in a Multitenant Environment

You can install Oracle R Enterprise Server in one or more pluggable databases (PDBs) within a multitenant environment. Oracle R Enterprise Server must be installed in a pluggable database, not in the root database.

If you have more than one instance of Oracle R Enterprise Server installed in a Multitenant Container Database (CDB) and you want to uninstall one instance but

retain the others, you can perform a partial uninstall as described in [Section 7.3.1.1, "Performing a Partial Uninstall"](#).

See Also:

- *Oracle R Enterprise User's Guide* for information about connecting to a pluggable database.
- *Oracle Database Concepts* for an introduction to multitenant architecture.
- *Oracle Database Administrator's Guide* for information about managing a multitenant environment.

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 4.3, "Oracle R Enterprise Server Requirements"](#)
 - Install Oracle R Enterprise Server and the supporting packages as described in [Section 4.4](#).
2. On the *first* node only, create a user, as described in [Section 7.5](#).

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 SSOPTIONS	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 website, 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. Download the file: `ord-linux-x86_64-3.1.1.tar.gz`. To download this file, you must obtain permission from Oracle Support:

- a. Log in to My Oracle Support.

```
https://support.oracle.com/
```

- b. Click **Contact Us**.

- c. Request permission to access this file:

```
ord-linux-x86_64-3.1.1.tar.gz
```

- d. When permission is granted, log in as root to any compute node and download the file.

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_64-3.1.1.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_64-3.1.1.tar.gz -d
/home/oracle/ORD/ord-linux-x86_64-3.1.1.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_64-3.1.1.tar.gz -C /home/oracle/ORD
$ ls /home/oracle/ORD/ord-linux-x86_64-3.1.1
```

Alternatively, you can download these RPMs from the Oracle public yum server. The locations of the RPMs are listed in [Example 5–2](#) through [Example 5–7](#).

Example 5–2 Oracle R Distribution 3.1.1 RPMs for Oracle Linux 5

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

```
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-core-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/R-devel-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-devel-3.1.1-2.el5.x86_64.rpm
http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/addons/x86_64/getPackage
/libRmath-static-3.1.1-2.el5.x86_64.rpm
```

If the dependent RPMs for Oracle Linux 5, listed in [Example 5–2](#), are not automatically included, then download and install them explicitly. The dependent RPMs are listed in [Example 5–3](#).

Example 5–3 Oracle R Distribution 3.1.1 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
avahi-compat-libdns_sd-devel-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
Cairo-devel-1.2.4-5.el5.x86_64.rpm
chkfontpath-1.10.1-1.1.x86_64.rpm
cups-1.3.7-30.el5_9.3.x86_64.rpm
cups-devel-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
e2fsprogs-devel-1.39-36.0.1.el5_9.x86_64.rpm
ed-0.2-39.el5_2.x86_64.rpm
fontconfig-devel-2.4.1-7.el5.x86_64.rpm
freetype-devel-2.2.1-32.el5_9.1.x86_64.rpm
gcc-gfortran-4.1.2-54.el5.x86_64.rpm
gdk-pixbuf-0.22.0-25.el5.x86_64.rpm
gdk-pixbuf-devel-0.22.0-25.el5.x86_64.rpm
ghostscript-8.70-14.el5_8.1.x86_64.rpm
ghostscript-fonts-5.50-13.1.1.noarch.rpm
glib2-devel-2.12.3-4.el5_3.1.x86_64.rpm
gmp-4.1.4-10.el5.x86_64.rpm
```

```

gnutls-devel-1.4.1-14.el5_10.x86_64
gtk2-2.10.4-29.el5.x86_64.rpm
gtk+-1.2.10-57.el5.x86_64.rpm
hicolor-icon-theme-0.9-2.1.noarch.rpm
keyutils-libs-devel-1.2-1.el5.x86_64.rpm
krb5-devel-1.6.1-70.el5_9.2.x86_64.rpm
libfontenc-1.0.2-2.2.el5.x86_64.rpm
libFS-1.0.0-3.1.x86_64.rpm
libgcrypt-devel-1.4.4-7.el5_10.x86_64.rpm
libgfortran-4.1.2-54.el5.x86_64.rpm
libgpg-error-devel-1.4-2.x86_64.rpm
libpng-devel-1.2.10-17.el5_8.x86_64.rpm
libRmath-3.1.1-2.el5.x86_64.rpm
libRmath-devel-3.1.1-2.el5.x86_64.rpm
libselenium-devel-1.33.4-5.7.el5.x86_64.rpm
libsepol-devel-1.15.2-3.el5.x86_64.rpm
libtiff-3.8.2-19.el5_10.x86_64.rpm
libtiff-devel-3.8.2-19.el5_10.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
libXext-devel-1.0.1-2.1.i386.rpm
libXext-devel-1.0.1-2.1.x86_64.rpm
libXfont-1.2.2-1.0.4.el5_7.x86_64.rpm
libXft-devel-2.1.10-1.1.x86_64.rpm
libXrender-devel-0.9.1-3.1.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
pango-devel-1.14.9-8.0.1.el5_7.3.x86_64.rpm
paps-0.6.6-20.el5.x86_64.rpm
pcre-devel-6.6-9.el5.x86_64.rpm
poppler-0.5.4-19.el5.x86_64.rpm
poppler-utils-0.5.4-19.el5_9.2.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-3.0-33.8.el5_5.6.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-xf86-1.0.2-5.el5_6.1.x86_64.rpm
zlib-devel-1.2.3-7.el5.x86_64.rpm

```

Example 5-4 Oracle R Distribution 3.1.1 RPMs for Oracle Linux 6

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

```

http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-core-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/R-devel-3.1.1-2.el6.x86_64.rpm

```

```

http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-devel-3.1.1-2.el6.x86_64.rpm
http://public-yum.oracle.com/repo/OracleLinux/OL6/addons/x86_64/getPackage
/libRmath-static-3.1.1-2.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
```

Example 5–5 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-3.0.1-2.x86_64.rpm
R-core-3.0.1-2.x86_64.rpm
R-devel-3.0.1-2.x86_64.rpm
libRmath-3.0.1-2.x86_64.rpm
libRmath-devel-3.0.1-2.x86_64.rpm
libRmath-static-devel-3.0.1-2.x86_64.rpm

```

If the dependent RPMs for Oracle Linux 5, listed in [Example 5–5](#), are not automatically included, then download and install them explicitly. The dependencies are listed in [Example 5–6](#).

Example 5–6 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-xf86-dev-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

```

Example 5-7 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
libRmath-static-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
```

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_64-3.1.1/*.*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 3.1.1 (--) -- "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 3.1.1 on a Linux Exadata system are listed in [Example 5–8](#).

Example 5–8 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_64-3.1.1.tar.gz -d
/home/oracle/ORD/ord-linux-x86_64-3.1.1.tar.gz
dcli -t -g nodes -l root tar xvfz /home/oracle/ORD/ord-linux-x86_64-3.1.1.tar.gz
-C /home/oracle/ORD
dcli -t -g nodes -l root rpm -i --force
/home/oracle/ORD/ord-linux-x86_64-3.1.1/*.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. Ensure that the ORACLE_HOME, ORACLE_SID, R_HOME, PATH, and LD_LIBRARY_PATH environment variables are properly set on each node. For example, you could specify values like the following in a bashrc file:

```
export ORACLE_HOME=/hostname/app/oracle/product/11.2.0.4/dbhome_1
export ORACLE_SID=ORCL
export R_HOME=/usr/lib64/R
export PATH=$PATH:$R_HOME/bin:$ORACLE_HOME/bin
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$ORACLE_HOME/lib:$R_HOME/lib
```

2. 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 1.4.1.

```
ore-server-linux-x86-64-1.4.1.zip
ore-supporting-linux-x86-64-1.4.1.zip
```

3. Login as root, and copy the installers for Oracle R Enterprise Server and the supporting packages across nodes. For example:

```
$ dcli -g nodes -l oracle mkdir -p /home/oracle/ORE
$ dcli -g nodes -l oracle -f ore-server-linux-x86-64-1.4.1.zip -d
  /home/oracle/ORE/ore-server-linux-x86-64-1.4.1.zip
$ dcli -g nodes -l oracle -f ore-supporting-linux-x86-64-1.4.1.zip -d
  /home/oracle/ORE/ore-supporting-linux-x86-64-1.4.1.zip
```

4. Unzip the supporting packages on each node:

```
$ dcli -t -g nodes -l oracle unzip
  /home/oracle/ORE/ore-supporting-linux-x86-64-1.4.1.zip -d
  /my_destination_directory/
```

5. Install Oracle R Enterprise server components:

```
$ dcli -t -g nodes -l oracle "cd /my_destination_directory; ./server.sh -y
  --admin --sys syspassword --perm permtablespace
  --temp temptablespace --rqsys rqsyspassword
  --user-perm usertablespace --user-temp usertemptablespace
  --pass ruserpassword --user RQUSER"
```

Note: The server script creates a user for Oracle R Enterprise. By default, the script does *not* grant the rqadmin role to the user.

Any Oracle R Enterprise user can execute embedded R, but only those with the rqadmin role can create and drop the R scripts in the database. Use caution when granting the rqadmin role.

See Section 7.5.1, "About the RQADMIN Role"

6. Verify Oracle R Enterprise loads.

```
> library(ORE)
Loading required package: OREbase
Attaching package: OREbase
The following objects are masked from âpackage:baseâ:
```

```

    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 4.5, "Verifying the Oracle R Enterprise Server Installation"](#)
- [Section 4.5.2, "Running the Oracle R Enterprise Example Scripts"](#)

5.4.1 DCLI Commands Summary for Oracle R Enterprise Server

The DCLI commands used to install Oracle R Enterprise Server 1.4.1 and the supporting packages on a Linux Exadata system are listed in [Example 5–9](#).

Example 5–9 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-x86-64-1.4.1.zip -d
/home/oracle/ORE/ore-server-linux-x86-64-1.4.1.zip
dcli -g nodes -l oracle -f ore-supporting-linux-x86-64-1.4.1.zip -d
/home/oracle/ORE/ore-supporting-linux-x86-64-1.4.1.zip
dcli -t -g nodes -l oracle /home/oracle/ORE/server/./server.sh
./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;
exit;
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](#)
- [Installing the Oracle R Enterprise Packages](#)
- [Installing the Oracle R Enterprise Supporting Packages](#)
- [Connecting Oracle R Enterprise Client to Oracle R Enterprise Server](#)

6.1 About Oracle R Enterprise Client

Oracle R Enterprise includes several components that must be installed separately on each client computer.

Components of Oracle R Enterprise Client

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

The Oracle R Enterprise client components can be installed in any order:

See Also: [Figure 1–2](#) for an illustration of the client and server components of Oracle R Enterprise.

6.1.1 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, standalone 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.

6.1.2 About the Oracle R Enterprise Packages

The Oracle R Enterprise packages, shown in [Table 6–1](#), are a set of Oracle proprietary packages that support Oracle R Enterprise. These packages are required on each client computer and on the server computer that hosts Oracle R Enterprise Server. On the server, the Oracle R Enterprise packages are installed automatically by the Oracle R Enterprise Server installation script.

Table 6–1 Oracle R Enterprise 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 About the 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 packages.

Table 6–2 Oracle R Enterprise Supporting Packages

Package Name	Description
arules	Provides the infrastructure for representing, manipulating and analyzing transactional data and patterns (frequent itemsets and association rules)
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.
statmod	Provides statistical modeling functions, including growth curve comparisons, limiting dilution analysis, mixed linear models, heteroscedastic regression, Tweedie family generalized linear models, the inverse-Gaussian distribution and Gauss quadrature

6.2 Installing Oracle Database Instant Client

As described in [Section 6.1.1](#), Oracle R Enterprise requires Oracle Database client software. Oracle Instant Client is suitable for most configurations of Oracle R Enterprise.

This topic includes these sections:

- Section 6.2.1, "Installing Oracle Database Instant Client on Windows"
- Section 6.2.2, "Installing Oracle Database Instant Client on Linux or UNIX"

6.2.1 Installing Oracle Database Instant Client on Windows

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** 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
```

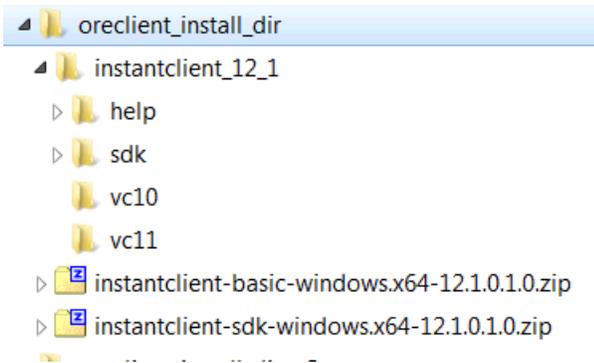
9. Return to the Instant Client Downloads for Microsoft Windows (x64) page:

```
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:
 - a. In Windows Control Panel, choose **System**, then click **Advanced system settings**.
 - b. On the **Advanced** tab, click **Environment Variables**.
 - c. Under **System variables**, create OCI_LIB64 if it does not already exist. Set the value of OCI_LIB64 to c:\oreclient\instantclient_12_1.
 - d. Under **System variables**, edit PATH to include c:\oreclient\instantclient_12_1.

See Also: Section 7.6, "Creating and Modifying Environment Variables on Windows"

6.2.2 Installing Oracle Database Instant Client on Linux or UNIX

You can install Oracle Database Instant Client from a zip file on Linux or UNIX systems. On Linux, you can also install from RPMs.

This topic includes these sections:

- Section 6.2.2.1, "Installing Oracle Instant Client from a Zip File"
- Section 6.2.2.2, "Installing Oracle Instant Client on Linux from RPMs"

6.2.2.1 Installing Oracle Instant Client from 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 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
```

6.2.2.2 Installing 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**.
6. As the root user, install the RPM:

```
rpm -i 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. As root, install the RPM:

```
rpm -i oracle-instantclient12.1-sdk-12.1.0.1.0-1.x86_64.rpm
```

9. The RPMs place the files in standard locations that the ROracle 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 Installing the Oracle R Enterprise Packages

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

This topic includes these sections:

- Section 6.3.1, "Installing the Oracle R Enterprise Packages on Windows"
- Section 6.3.2, "Installing the Oracle R Enterprise Packages on Linux or UNIX"

6.3.1 Installing the Oracle R Enterprise Packages on Windows

1. Download the Oracle R Enterprise packages from 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 and select the Oracle R Enterprise packages for your platform. Download the zip file to the installation directory that you created for Oracle Instant Client. For example:

```
c:\oreclient_install_dir\ore-client-win-x86_64-1.4.1.1.zip
```

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

3. 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 the Oracle R Enterprise packages.

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

```
c:\oreclient_install_dir
  \client
    \ORE_1.4.1.zip
    \OREbase_1.4.1.zip
    \OREcommon_1.4.1.zip
    \OREdm_1.4.1.zip
    \OREeda_1.4.1.zip
    \OREembed_1.4.1.zip
    \OREgraphics_1.4.1.zip
    \OREmodels_1.4.1.zip
    \OREpredict_1.4.1.zip
    \OREstats_1.4.1.zip
    \ORExml_1.4.1.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_64-1.4.1.zip

```

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

- **Install from the R Console**

- a. Start R x64 from the Windows Start menu.
- b. 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
```

- **Install from the R GUI**

- a. Start R x64 from the Windows Start menu.
- b. Select **Packages** from the **RGui (64-bit)** menu bar.
- c. From the **Packages** menu, select **Install package(s) from local zip files**.
- d. Change to the `client` directory.
- e. Select all the files in the directory.
- f. Click **Open**.

Each package installation produces this message in the R console:

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

- **Install from the Windows command prompt**

- a. Start R x64 from the Windows Start menu.
- b. Open a Windows command window.
- c. Change directory to the `client` directory and type these commands:

```

R CMD INSTALL OREbase_1.4.1.zip
R CMD INSTALL OREcommon_1.4.1.zip
R CMD INSTALL OREstats_1.4.1.zip
R CMD INSTALL OREgraphcs_1.4.1.zip
R CMD INSTALL OREeda_1.4.1.zip
R CMD INSTALL OREembed_1.4.1.zip
R CMD INSTALL ORExml_1.4.1.zip
R CMD INSTALL OREdm_1.4.1.zip
R CMD INSTALL OREmodels_1.4.1.zip
R CMD INSTALL OREpredict_1.4.1.zip
R CMD INSTALL ORE_1.4.1.zip

```

Each package installation generates this message:

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

6.3.2 Installing the Oracle R Enterprise Packages on Linux or UNIX

1. Download the Oracle R Enterprise packages from 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 and select the Oracle R Enterprise packages for your platform. Download the zip file to the installation directory that you created for Oracle Instant Client. For example:

```
/oreclient_install_dir/ore-client-platform-arch-1.4.1.1.zip
```

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

3. Unzip the file:

```
% unzip ore-client-platform-arch-1.4.1.zip
```

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

```
/client/ORE_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREbase_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREcommon_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREdm_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREeda_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREembed_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREgraphics_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREmodels_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREpredict_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/OREstats_1.4.1_R_arch-unknown-platform-gnu.tar.gz
/client/ORExml_1.4.1_R_arch-unknown-platform-gnu.tar.gz
```

4. Change to `/oreclient_install_dir/client`.

5. Execute the following commands:

```
R CMD INSTALL ORE_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREbase_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREcommon_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREdm_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREeda_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREembed_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREgraphics_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREmodels_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREpredict_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL OREstats_1.4.1_R_arch-unknown-platform-gnu.tar.gz
R CMD INSTALL ORExml_1.4.1_R_arch-unknown-platform-gnu.tar.gz
```

6.4 Installing the Oracle R Enterprise Supporting Packages

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

This topic includes these sections:

- Section 6.4.1, "Installing the Supporting Packages on Windows"
- Section 6.4.2, "Installing the Supporting Packages on Linux or UNIX"

6.4.1 Installing the Supporting Packages on Windows

1. Download the supporting packages from 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 and select the **Supporting** packages for your platform. Download the zip file to the installation directory that you created for Oracle Instant Client. For example:

```
c:\oreclient_install_dir\ore-supporting-win-x86_64-1.4.1.1.zip
```

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

3. 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 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
        \arules_1.1-3.zip
        \Cairo_1.5-5.zip
        \DBI_0.2-7.zip
        \png_0.1-7.zip
        \ROracle_1.1-12.zip
        \statmod_1.4.20.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_64-1.4.1.zip
ore-supporting-win-x86_64-1.4.1.zip
```

4. Choose one of the following methods to install the supporting packages on Windows:

- **Install from the R Console**

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

```
install.packages("oreclient_install_dir/support/support_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
```

- **Install from the R GUI**

- a. Start R x64 from the Windows Start menu.
- b. Select **Packages** from the **RGui (64-bit)** menu bar.
- c. From the **Packages** menu, select **Install package(s) from local zip files**.

- d. Change to the support directory.
- e. Select all the files in the directory.
- f. Click **Open**.

Each package installation produces this message in the R console:

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

- **Install from the Windows command prompt**

- a. Start R x64 from the Windows Start menu.
- b. Open a Windows command window.
- c. Change directory to the client directory and type these commands:

```
R CMD INSTALL ROracle_1.1-12.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
R CMD INSTALL arules_1.1-3.zip
R CMD INSTALL statmod_1.4.20.zip
```

Each package installation generates this message:

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

6.4.2 Installing the Supporting Packages on Linux or UNIX

1. Download the Oracle R Enterprise packages from 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 and select the **Supporting** packages for your platform. Download the zip file to the installation directory that you created for Oracle Instant Client. For example:

```
/oreclient_install_dir/ore-supporting-platform-arch-1.4.1.1.zip
```

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

3. Unzip the file:

```
% unzip ore-supporting-platform-arch-1.4.1.1.zip
```

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

```
/supporting/arules_1.1-3_R_arch-unknown-platform.tar.gz
/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_1.1-12_R_arch-unknown-platform.tar.gz
/supporting/statmod_1.4.20_R_arch-unknown-platform.tar.gz
```

4. Change to `/oreclient_install_dir/supporting`
5. Execute the following commands:

```
R CMD INSTALL ROracle_1.1-12_R_arch-unknown-platform.tar.gz
R CMD INSTALL DBI_0.2-7_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
R CMD INSTALL arules_1.1-3_R_arch-unknown-platform.tar.gz
R CMD INSTALL statmod_1.4.20_R_arch-unknown-platform.tar.gz
```

6.5 Connecting Oracle R Enterprise Client to Oracle R Enterprise Server

To connect Oracle R Enterprise Client to Oracle R Enterprise Server, start R using the ORE script:

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

The following examples connect as user RQUSER with password RQUSERpsw:

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

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

Note: To avoid specifying the password and other connection details in embedded R scripts, you can use Oracle Wallet. See [Section 7.7, "Creating an Oracle Wallet for an Oracle R Enterprise Connection"](#).

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

```
ore.connect("RQUSER", password="RQUSERpsw", conn_string="", all=TRUE)
```

See Also: *Oracle R Enterprise User's Guide* for details about connecting to Oracle R Enterprise Server.

Administrative Tasks for Oracle R Enterprise

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

- [Upgrading Oracle R Enterprise](#)
- [Migrating Oracle R Enterprise Data](#)
- [Uninstalling Oracle R Enterprise](#)
- [Installing Additional R Packages on Linux or UNIX](#)
- [Creating a Database User for Oracle R Enterprise](#)
- [Creating and Modifying Environment Variables on Windows](#)
- [Creating an Oracle Wallet for an Oracle R Enterprise Connection](#)
- [Controlling Memory Used by Embedded R](#)

7.1 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 and migrate your data:

1. Ensure that you have the version of R that is required for the new version of Oracle R Enterprise.

See [Table 1–2, "Oracle R Enterprise Server Support Matrix"](#) for the R requirement.

2. To upgrade Oracle R Enterprise Server, run the `server` script to perform an installation:

```
./server.sh --install
```

When the script detects an earlier version of Oracle R Enterprise Server, it asks if you want to upgrade. Type `Yes` to start the upgrade. (Type `No` to aborts the process.)

See [Section 4.2, "About the SERVER Script"](#) for details.

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

See [Chapter 6, "Installing Oracle R Enterprise Client"](#) for instructions.

7.2 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.

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_screxport.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`.

7.3 Uninstalling Oracle R Enterprise

This topic contains these sections:

- [Section 7.3.1, "Uninstalling Oracle R Enterprise Server"](#)
- [Section 7.3.2, "Uninstalling Oracle R Enterprise Client"](#)

See Also: [Section 3.7, "Uninstalling Oracle R Distribution"](#)

7.3.1 Uninstalling Oracle R Enterprise Server

To uninstall Oracle R Enterprise Server, run the `server` script with the `--uninstall` option. you can perform either a full or a partial uninstall. A partial uninstall is performed by default.

7.3.1.1 Performing a Partial Uninstall

A partial uninstall removes the `rqsys` metadata and PL/SQL packages from the database but leaves the libraries and R packages that support Oracle R Enterprise Server in Oracle home. If Oracle R Enterprise Server support is installed in more than one database instance in the same Oracle home, or if it is installed in a pluggable database (PDB), then a partial uninstall removes Oracle R Enterprise Server support from the specified database without affecting the other databases. The `server` script performs a partial uninstall by default.

Note: If you accidentally perform a full uninstall for one of the instances or PDBs that share support for Oracle R Enterprise Server, then the other shared instances or PDBs will no longer support Oracle R Enterprise Server. You can easily restore Oracle R Enterprise Server support in Oracle home by rerunning the `server` script to perform an installation in one of the shared instances or PDBs.

If you run the `server` script with the `-u` option, then a partial uninstall is performed. You can specify the `--keep` option to explicitly request a partial uninstall. The following commands all perform a partial uninstall of Oracle R Enterprise Server:

```
./server.sh --uninstall
./server.sh -u
./server.sh -u --keep
./server.sh --uninstall --keep
```

7.3.1.2 Performing a Full Uninstall

A full uninstall removes the `rgsys` metadata and PL/SQL code from the database and removes all Oracle R Enterprise Server libraries and R packages from Oracle home.

The following commands both perform a full uninstall of Oracle R Enterprise Server:

```
./server.sh --uninstall --full
./server.sh -u -full
```

Note: If you accidentally perform a full uninstall in a shared Oracle home, then rerun the `server` script to reinstall Oracle R Enterprise Server support. See [Section 7.3.1.1](#) for details.

7.3.2 Uninstalling Oracle R Enterprise Client

To uninstall the Oracle R Enterprise packages and supporting packages, start R and type the commands listed in [Example 7-1](#).

Example 7-1 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("Cairo")
remove.packages("png")
remove.packages("OREdm")
remove.packages("OREpredict")
remove.packages("arules")
remove.packages("statmod")
```

7.4 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
```

7.5 Creating a Database User for Oracle R Enterprise

The server script installation process automatically creates or configures a user for Oracle R Enterprise if one does not already exist.

Example 7-2 *Creating an Oracle R Enterprise User*

```
./server.sh
```

```
.
```

```
Choosing ORE user
```

```
ORE user to use [list]:
```

Press **Enter** to display a list of available users.

```
BI
```

```
HR
```

```
IX
```

```
OE
```

```
SCOTT
```

```
SH
```

```
ORE user to use [list]: ruser2
```

```
.
```

If you choose a user that exists, the script configures the user to support Oracle R Enterprise. If you specify a user that does not already exist, the script creates the user.

Example 7-3 *Creating an Oracle R Enterprise User in SQL*Plus*

You can create an Oracle R Enterprise user in SQL*Plus by following these steps:

1. Log in with system privileges:

```
SQLPLUS / AS SYSDBA
```

2. Execute a statement like the following to create the user:

```
CREATE USER ore_username IDENTIFIED BY password
DEFAULT TABLESPACE default_tablepace_name
TEMPORARY TABLESPACE temp_tablespace_name
QUOTA UNLIMITED ON default_tablespace_name;
```

See Also: *Oracle Database SQL Language Reference* for details about creating a user

3. Grant the required privileges:

```
GRANT CREATE SESSION,
      CREATE TABLE,
      CREATE VIEW,
      CREATE PROCEDURE,
      CREATE MINING MODEL
TO ore_username;
```

See Also: *Oracle Database SQL Language Reference* for details about granting privileges to a user

7.5.1 About the RQADMIN Role

The server script installation process creates a database role called `rqadmin`. When the `rqadmin` role is granted to an Oracle R Enterprise user, the user can create and drop R scripts for embedded R execution. By default, the server script does *not* grant the `rqadmin` role to the Oracle R Enterprise user.

Note: Any Oracle R Enterprise user can execute embedded R, but only Oracle R Enterprise users with the `rqadmin` role can create and drop the R scripts.

As shown in [Section 4.2.3.4](#), you can run the server script with the `--admin` option to grant the `rqadmin` role to an Oracle R Enterprise user. The `--admin` option is only available when you run the script in batch mode.

If you choose to grant the `rqadmin` role in SQL*Plus, then log in with system privileges and execute a statement like the following:

```
SQLPLUS / AS SYSDBA
GRANT RQADMIN TO ore_username;
```

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

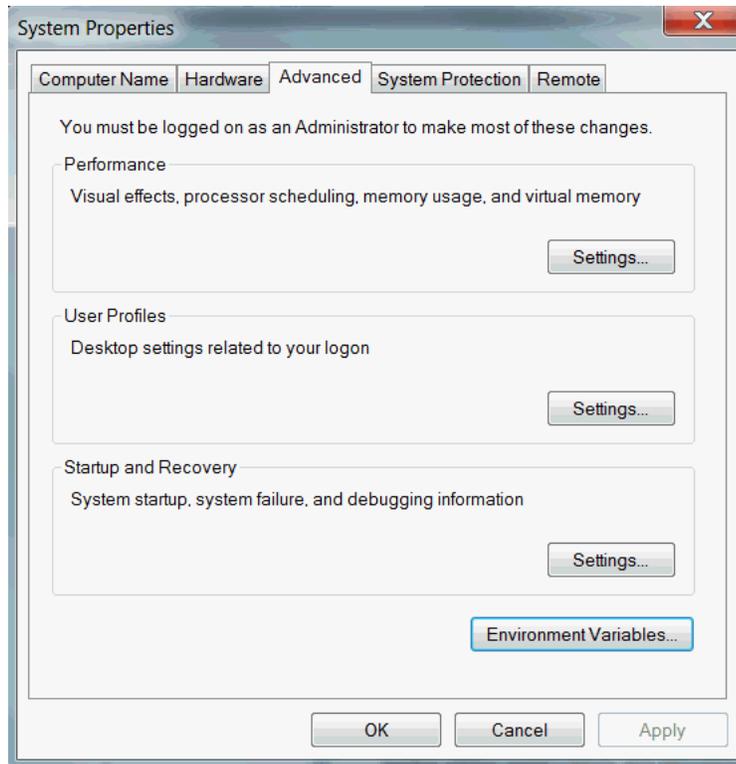
7.6 Creating and Modifying Environment Variables on Windows

If the `PATH`, `ORACLE_SID`, and `ORACLE_HOME` environment variables do not exist, you must create them and assign the values specified in [Figure 7-2](#). 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:

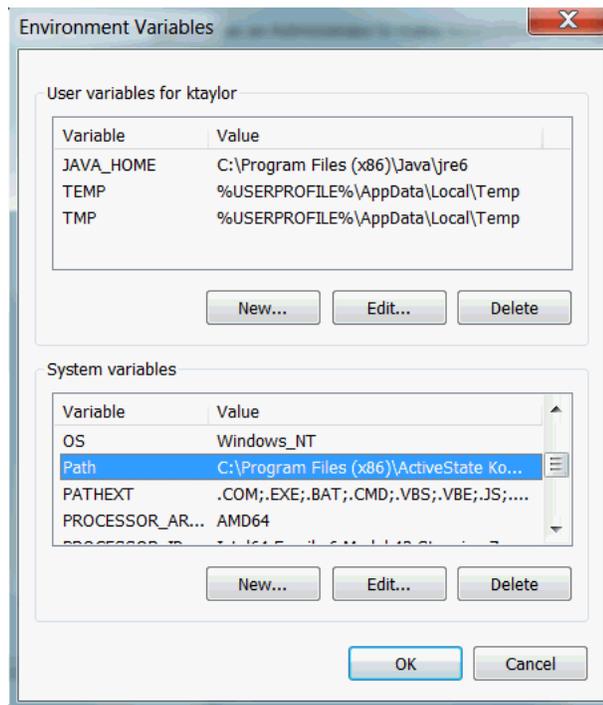
1. Right-click the **Computer** icon and choose **Properties**, or in Windows Control Panel, choose **System**.
2. Choose **Advanced system settings**.

Figure 7-1 Advanced System Settings in Windows



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

Figure 7-2 Environment Variables Dialog in Windows



4. Click **New** to create a new environment variable. Click **Edit** to modify an existing environment variable.

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

7.7 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 12.1, see “Using Oracle Wallet Manager” in *Oracle Database Enterprise User Security Administrator’s Guide*:
<http://www.oracle.com/pls/topic/lookup?ctx=db121&id=DBIMI160>
 - For Oracle Database 11.2, see “Using Oracle Wallet Manager” in *Oracle Database Advanced Security Administrator’s Guide*:
<http://www.oracle.com/pls/topic/lookup?ctx=db112&id=ASOAG160>
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)
```

7.8 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 7-1.

Table 7-1 *SYS.RQCONFIGSET Keyword Arguments*

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

Example 7-4 *SQL Commands for Controlling Memory Used by Embedded R*

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

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

-- 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', '10M');

-- 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	1.4.1

MIN_VSIZE	32M
MAX_VSIZE	4G
MIN_NSIZE	2M
MAX_NSIZE	20M

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](#)

Note: This appendix describes an initial installation of Oracle R Enterprise. If Oracle R Enterprise components already exist on your client or server, refer to [Section 7.1, "Upgrading 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. [Verify the environment](#)
2. [Install Oracle R Distribution](#)
3. [Install Oracle R Enterprise Server](#)

A.2.1 Verify the environment

Table A–1 Checklist for Oracle R Enterprise Server Requirements

Question	Sample Answer
What is the Linux version?	<pre>% cat /etc/*-release Enterprise Linux Server release 5.6</pre>
Do you have access to the internet?	Start a browser
Can you log in as root?	<pre>% sudo -s Password: ----- # # exit %</pre>
Is Oracle Database installed?	<pre>% SQLPLUS / as sysdba Copyright (c) 1982, 2014, Oracle. All rights reserved. Connected to: Oracle Database 12c Enterprise Edition Release 12.1.0.1.0 - 64bitProduction With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options > exit %</pre>
What is the value of \$ORACLE_HOME?	<pre>% echo \$ORACLE_HOME /myhome/product/12.1.0.1/dbhome_1</pre>
What is the value of \$ORACLE_SID?	<pre>% echo \$ORACLE_SID orcl</pre>
Does \$LD_LIBRARY_PATH include \$ORACLE_HOME/lib?	<pre>% echo \$LD_LIBRARY_PATH /myhome/product/12.1.0.1/dbhome_1/lib:....</pre>
Does \$PATH include \$ORACLE_HOME/bin?	<pre>% echo \$PATH /myhome/product/12.1.0.1/dbhome_1/bin:.....</pre>
Are you a member of the dba group?	<pre>% groups g102 dba</pre>
Can you write to \$ORACLE_HOME/lib?	<pre>% ls -ld \$ORACLE_HOME/lib drwxr-xr-x 3 myuser g102 12288 Jan 27 15:31 /myhome/product/12.1.0.1/dbhome_1/lib/ ...</pre>

A.2.2 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 3.1.1 by executing this command:

```
yum install R-3.1.1
```

5. Exit the root user.

```
exit
```

A.2.3 Install Oracle R Enterprise Server

Oracle R Enterprise Server includes the `rqsys` schema in Oracle Database and Oracle R Enterprise packages and shared libraries.

To install Oracle R Enterprise Server:

1. Verify the environment according to [Table A-1, "Checklist for Oracle R Enterprise Server Requirements"](#).
2. Create an installation directory for the Oracle R Enterprise server components. The directory can have any name. For example:

```
/myhome/myoreserver/
```

3. Download the Oracle R Enterprise Server installation files and supporting packages from 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
```

- a. Accept the license agreement and download the Oracle R Enterprise **Server** files for your platform to your installation directory.
- b. Accept the license agreement and download the Oracle R Enterprise **Supporting** packages for your platform to your installation directory.

The installation directory now contains two zip files.

```
ore-server-linux-x86-64-1.4.1.zip
ore-supporting-linux-x86-64-1.4.1.zip
```

4. Unzip the files.

```
unzip ore-server-linux-x86-64-1.4.1.zip
unzip ore-supporting-linux-x86-64-1.4.1.zip
```

The installation directory looks like this after you unzip both files:

```
/myhome/myoreserver
  ore-server-linux-x86-64-1.4.1.zip
  ore-supporting-linux-x86-64-1.4.1.zip
  server.sh
  /server
  /supporting
```

5. Run `server.sh` to perform a default installation of Oracle R Enterprise Server as shown in [Example A-1](#). The script runs interactively. User input is shown in bold.

Note: When the script displays `[list]` in a prompt, you can press **Enter** to obtain a list of available items for your choice.

Example A-1 A Default, First-Time Installation of Oracle R Enterprise Server

```
ktaylor@adc2171704> ./server.sh -i

Oracle R Enterprise 1.4.1 Server.

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Checking platform ..... Pass
Checking R ..... Pass
Checking R libraries ..... Pass
Checking ORACLE_HOME ..... Pass
Checking ORACLE_SID ..... Pass
Checking sqlplus ..... Pass
Checking ORACLE instance ..... Pass
Checking CDB/PDB ..... Pass
Checking ORE ..... Pass

Choosing RQSYS tablespaces
  PERMANENT tablespace to use for RQSYS [list]:
EXAMPLE
SYSaux
SYSTEM
USERS
  PERMANENT tablespace to use for RQSYS [list]: SYSaux
  TEMPORARY tablespace to use for RQSYS [list]:
TEMP
  TEMPORARY tablespace to use for RQSYS [list]: TEMP
Choosing RQSYS password
  Password to use for RQSYS: XXXXXXXX

Choosing ORE user
  ORE user to use [list]:
BI
HR
IX
OE
SCOTT
SH
  ORE user to use [list]: ruser2
Choosing RUSER2 tablespaces
  PERMANENT tablespace to use for RUSER2 [list]: USERS
```

```

TEMPORARY tablespace to use for RUSER2 [list]: TEMP
Choosing RUSER2 password
Password to use for RUSER2:

Current configuration
R Version ..... Oracle Distribution of R version 3.1.1
(--)
R_HOME ..... /usr/lib64/R
R_LIBS_USER ..... /product/12.1.0.1/dbhome_1/R/library
ORACLE_HOME ..... /product/12.1.0.1/dbhome_1
ORACLE_SID ..... orcl

Existing R Version ..... None
Existing R_HOME ..... None
Existing ORE data ..... None
Existing ORE code ..... None
Existing ORE libraries ..... None

RQSYS PERMANENT tablespace ..... SYSAUX
RQSYS TEMPORARY tablespace ..... TEMP

ORE user type ..... New
ORE user name ..... RUSER2
ORE user PERMANENT tablespace ..USERS
ORE user TEMPORARY tablespace .. TEMP
Grant RQADMIN role ..... No

Operation ..... Install/Upgrade/Setup

Proceed? [yes] y

Removing R libraries ..... Pass
Installing R libraries ..... Pass
Installing ORE libraries ..... Pass
Installing RQSYS data ..... Pass
Configuring ORE ..... Pass
Installing RQSYS code ..... Pass
Installing ORE packages ..... Pass
Creating ORE script ..... Pass
Installing migration scripts ..... Pass
Installing supporting packages ..... Pass
Creating ORE user ..... Pass
Granting ORE privileges ..... Pass

Done

```

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:

To install Oracle R Enterprise on the Client:

1. [Install Oracle R Distribution on the Windows Client](#)
2. [Install Oracle Instant Client](#)
3. [Install the Oracle R Enterprise Packages](#)

4. 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 and that you have access to the internet.

See Also:

- Table 1–1, "Oracle R Enterprise Platform Requirements"
- Section 1.4.1, "Verifying 64-Bit Architecture on Microsoft Windows"

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 3.1.1 Downloads**, select **R Distribution for Windows 64 bit**. Save the file on your computer.
`ORE-3.1.1-win.zip`
3. When you unzip the file, the executable file is extracted.
`ORE-3.1.1-win.exe`
4. Double click the executable file to start the installation of Oracle R Distribution.
5. Follow the instructions to complete the installation.

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** 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 Packages

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

To download the Oracle R Enterprise 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 the **Client** packages for Windows. Save the file in the installation directory that you created in [Section A.3.2](#).

```
c:\myoreclient\ore-client-win-x86_64-1.4.1.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_1.4.1.zip
OREbase_1.4.1.zip
OREcommon_1.4.1.zip
OREdm_1.4.1.zip
OREeda_1.4.1.zip
OREembed_1.4.1.zip
OREgraphics_1.4.1.zip
OREmodels_1.4.1.zip
OREpredict_1.4.1.zip
OREstats_1.4.1.zip
ORExml_1.4.1.zip
```

To install the Oracle R Enterprise 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-2](#)

2. Install the packages as follows:

```
install.packages("c:/myoreclient/client/ORE_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREbase_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREcommon_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREdm_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREeda_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREembed_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREgraphics_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREmodels_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREpredict_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/OREstats_1.4.1.zip", repos=NULL)
install.packages("c:/myoreclient/client/ORExml_1.4.1.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 and select the **Supporting** packages for Windows. Save the file in the installation directory that you created in [Section A.3.2](#).

```
c:\myoreclient\ore-supporting-win-x86_64-1.4.1.zip
```

3. Unzip the file.

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

```
arules_1.1-3.zip
Cairo_1.5-5.zip
DBI_0.2-7.zip
png_0.1-7.zip
ROracle_1.1-12.zip
statmod_1.4.20.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.

2. Install the packages as follows:

```
install.packages("c:/myoreclient/supporting/ROracle_1.1-12.zip", repos=NULL)
install.packages("c:/myoreclient/supporting/DBI_0.2-7.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)
install.packages("c:/myoreclient/supporting/arules_1.1-3.zip", repos=NULL)
install.packages("c:/myoreclient/supporting/statmod_1.4.20.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 4.3.3, "User Requirements"](#) for details.

Example A-2 Connecting to Oracle R Enterprise Server

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

1. Select **R x64 3.1.1** 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-3 Listing the Database Tables Accessible to RQUSER

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

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

Example A-4 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–5 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–6 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
freqanalysis	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–7 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-8 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-9 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-10 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
.
.
.
```

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](#)

B.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

B.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 website and follow the installation instructions:

```
http://www.rstudio.com/products/rstudio/download-server/
```

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/lib:ORACLE_HOME/lib
```

Note: The default value of `RHOME` on Linux is `/usr/lib64/R`.

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
```

4. Refer to the instructions for configuring the server at:

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

B.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 website:
<http://www.rstudio.com/products/rstudio/#Desk>
3. Run the installer and follow the prompts.
4. Click the desktop icon to initialize RStudio.

Oracle R Distribution Packages

Table C–1 lists the packages in Oracle R Distribution that are used by Oracle R Enterprise.

See Also:

- [Table 6–1](#) for a list of the packages supported by Oracle R Enterprise
- [Table 6–2](#) for a list of the open source packages that ship with Oracle R Enterprise

Table C–1 *Oracle R Distribution Packages 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
nnet	Feed-forward Neural Networks and Multinomial Log-Linear Models
parallel	Support for parallel computation, including random-number generation

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

Package Name	Package Description
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

License Information for Oracle R Enterprise

This appendix contains licensing information for third-party and open source products that are used in combination with Oracle R Enterprise. Licensing information for Oracle R Enterprise is in *Oracle Database Licensing Information*.

This appendix contains these topics:

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

D.1 Licensing for Open Source R

R is an open source language and environment that is governed by GPL2 and not under the terms of the Oracle license agreement.

R was initially written by Robert Gentleman and Ross Ihaka of the Statistics Department of the University of Auckland.

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

Douglas Bates
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>.

Current R-core members can be contacted via email to R-project.org with name made up by replacing spaces by dots in the name listed above.

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June 1991

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D.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.

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February 1999

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