

ASReml-R Installation Guide

Windows · Macintosh · Linux

VSN International

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1 Licensing

ASReml-R is distributed as an R library package containing precompiled binaries for i86 and x86_64 systems running Linux, Mac OSX[®] (R-3.0.0 and above) and Microsoft Windows[®] operating systems. ASReml requires a run-time license to operate; a fresh installation of ASReml-R involves three steps:

1. [Installing](#) the ASReml-R package,
2. Generating [license registration details](#), and
3. Installing a valid [license key](#)

An ASReml license key is available from [VSN International](#). On Linux and Mac systems, a file *asremlRegister.txt* containing the necessary information to be provided to support@vsni.co.uk to generate the key is created in the working folder; on Windows systems a GUI is raised to manage the acquisition and installation of the key. The license key must be installed correctly for the license manager to use it.

2 Quick Install

1. Download the ASReml-R archive and install as a source package into R using one of:

- the `packages` menu from within the R-gui;
- the `Install Packages` menu under `Tools` within Rstudio;
- the command line R CMD `INSTALL package`;
- a call to the R function `install.packages`

The ASReml library will be installed in a default location that depends on the target computer system and administration privileges of the installer. See Appendix A for a list of default installation locations, and Section 4 for details on a non-default ASReml-R installation using a personal R library tree.

2. Start R and load the ASReml package using

```
> library(asreml)
```

The ASReml license manager checks for a valid license as part of the load step. If a valid license is not found then:

- **Linux and Mac:** the file `asremlRegister.txt` containing target system details is created in the R working directory. An ASReml license can be obtained by completing and emailing `asremlRegister.txt` to [VSNi](#).
 - **Windows:** a dialogue is raised to manage license acquisition; be sure to check that this window is not raised behind the one currently in focus.
3. Once received, the license file `asreml.lic` (or its contents) must be installed in a location known to the ASReml license manager. See Appendix A for the a list of default license file locations. **Note:** if the license is stored outside the default location, the environment variable `ASREML_LICENSE_FILE` must be set (Section 4.7).

The license `asreml.lic` can be saved or copied directly to the default location, or installed with the GUI dialogue on Windows systems.

3 ASReml Package Information

3.1 License details

Detailed license information is returned in the `license` component of the ASReml object after fitting a model.

3.2 Version details

Version information is displayed by the ASReml function call

```
> asreml.About()
```

4 Detailed Installation Notes

These notes describe a per user installation of `asrem1` using a personal library tree. This is consistent across platforms and involves no known issues beyond file location differences. System-wide installations are in general dependent on user credentials, but are otherwise straightforward using system file equivalents to those discussed here (consult the R documentation).

It is good practice to install contributed R packages such as `asrem1` in non-system areas for ease of management through R version upgrades. On all platforms this involves a `.Renviron` file, and the `R_LIBS` environment variable if installing in non-default file locations.

4.1 A personal R library

R library trees are simply one or more user directories that will hold contributed R packages. One R start-up action is to look for a `.Renviron` file (location is platform dependent), and read the contents. The `R_LIBS` environment variable adds the nominated directories to the R library search path, and can be set in `.Renviron`.

1. Create a directory in a user writable area to hold `asrem1`, eg `MyRlib`
2. Using a text editor, create `.Renviron`
 - a) in the `My Documents` folder on Windows systems,
 - b) in your `HOME` directory on Linux and Mac systems

containing the line

```
R_LIBS=path-to-lib/MyRlib
```

where *path-to-lib* is the full path to the root of `MyRlib`. Be careful to ensure that `.Renviron` is text only, and contains no embedded formatting codes.

R will then

1. look in the additional `R_LIBS` directories when loading packages, and
2. unless otherwise specified, will install packages in the first directory in the `R_LIBS` search list.

4.2 Installing on Microsoft Windows

On older XP systems the default location for R is under `C:\Program Files`, and packages are by default installed under `C:\Program Files\R\library`. On Windows 7 type systems, administrator rights are needed to install R and packages such as `asrem1` in the system area; see the R [FAQ](#) (reproduced in [Appendix B](#)) for a discussion of R and package installation behaviour on these systems. Installing `asrem1` to a [personal library tree](#) avoids security based issues.

1. Set up a [personal R library](#);
2. Install `ASReml-R` using one of the methods in [Section 2](#).

By default, `asrem1` is installed in the first location referenced by `R_LIBS`, or if not set then an operating system dependent location is chosen ([Appendix A](#)).

3. The R function call `library(asreml)` will add the `asreml` package to the current R session search path. Consult the R documentation for ways to automate this or for alternative methods.

Help on the alternative installation methods is available via the help system within R by typing `help(install.packages)` or `help(INSTALL)` at the R command prompt.

4.3 Linux systems

ASReml is distributed as a binary package in *tar.gz* form, `asreml_3.0.R_xx-linux-intel64.tar.gz`, for example, where `xx` is the version of the `asreml` shared library, and *intel64* indicates the target hardware architecture.

1. Login as a user with write permission to the target `asreml` directory;
2. Set up a [personal R library](#);
3. Install ASReml-R using one of the methods in Section 2.
By default, packages are installed in the library tree rooted at the first directory given in the environment variable `R.LIBS`, or a platform dependent default if neither are set.
4. The R function call `library(asreml)` will add `asreml` to the current R session search path and check for a valid license.
5. If you see the error message "Error: cannot restore segment prot after reloc: Permission denied" when trying to use the `asreml` function, you may be experiencing problems due to the default configuration of the SELinux kernel extensions. One possible solution is to change the default security context for ASReml by issuing the command:

```
chcon -t texrel_shlib_t /usr/lib/R/library/asreml/libs/*.so2.2
```

4.4 Apple Macintosh systems

ASReml is distributed as a binary package in *tar.gz* form, `asreml_3.0.R_xx-darwin.tar.gz`, for example, where `xx` is the version of the `asreml` shared library. **Note** that only x86_64 hardware is supported from R-3.0.0 onwards.

ASReml-R can be installed manually on Mac systems similarly to Linux, or via the R-gui. In both cases, setting up a [personal R library](#) is recommended:

1. Set up a [personal R library](#)
 - a) Login as a user with write permission to the target `asreml` directory;
 - b) Create a new folder (eg, `MyRlib`) for the root of the R library tree;
 - c) Using `TextEdit`, create a `.Renviron` file in your HOME directory containing the line

```
R.LIBS=path-to-lib/MyRlib
```

where *path-to-lib* is of the form `/Users/userid` and *userid* is your logon id.
2. Install ASReml-R using one of the methods in Section 2:
 - From within the R-gui, choose **Packages & Data** from the top menu bar;
 - From within Rstudio choose **Install packages** from the **Tools** menu.
3. The R function call `library(asreml)` will add `asreml` to the current R session search path and check for a valid license.

4.5 Commandline install

A command line installation can be done on all platforms assuming the the R executable is on the operating system search path:

1. Login as a user with write permission to the target `asreml` directory;
2. Open a terminal window;
3. At the system command prompt execute

```
R CMD INSTALL [--library lib] asreml.<target system>.tar.gz
```

The target library tree can be optionally specified via the `--library` flag. By default, packages are installed in the library tree rooted at the first directory given in the environment variable `R_LIBS` (see setting up a [personal R library](#)), or a system default if neither are set.

4.6 Obtaining an asreml license

In the absence of a license file, loading `asreml` into R will generate a file `asremlRegister.txt` in the R working directory (Linux and Mac), or raise a dialogue box (Windows). An `asreml` license can be obtained from VSN by completing and emailing `asremlRegister.txt` to [VSNi](#) or following the directions in the Windows GUI.

4.7 Installing an asreml license

The license file `asreml.lic` can be saved to any convenient location in the filesystem. The environment variable `ASREML_LICENSE_FILE` must be set for the license manager to locate the license file `asreml.lic` if the license is **not** saved to the default location.

On all systems, `ASREML_LICENSE_FILE` can be set from the `.Renviron` file. For example, if the path to the license file is `/Users/myusername/Licenses/asreml.lic`, then the following line can be appended to `.Renviron`:

```
ASREML_LICENSE_FILE=/Users/myusername/Licenses/asreml.lic
```

The environment variable `ASREML_LICENSE_FILE` could also be set by the usual operating system methods. The default locations of the license file `asreml.lic` on supported systems are given in [Appendix A](#).

5 Support

If you are unable to install or run `asreml`, or if you require further information or help, please contact VSN International:

VSN International Ltd.
5 The Waterhouse
Waterhouse Street
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Herts HP1 1ES
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Tel: +44 (0)1442 450230
Fax: +44 (0)870 1215653
<http://www.vsn.co.uk>
support@vsni.co.uk

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Windows is a trademark of Microsoft Corporation.

Macintosh is a trademark of Apple Corporation.

A System Installation Defaults

What	System	Where
ASReml	Windows 7	C:\Users\ <i>uname</i> \Documents\R\win-library\ <i>n.n</i> \asrem1 ^{1,2}
	Windows XP	C:\Program Files\R\R- <i>n.n.n</i> \library\asrem1
	Mac OSX	/Users/ <i>uname</i> /Library/R/ <i>n.n</i> /library/asrem1 ³
	Linux	/home/ <i>uname</i> /R/x86_64-pc-linux-gnu-library/asrem1 ⁴
License	Windows 7	C:\ProgramData\VSNi\asrem1.lic ⁵
	Windows XP	C:\Program Files\Common Files\VSN International\Licenses\asrem1.lic ⁶
	Mac OSX	/Users/ <i>uname</i> /asrem1.lic
	Linux	/home/ <i>uname</i> /asrem1.lic

Notes

¹ *uname* is the installer's user name on the target system.

² *n.n* (*n.n.n*) is a two (three) digit R version number.

³ the **Library** folder is not visible by default in **Finder**.

⁴ example only; the actual location of R contributed packages may differ among Linux brands and is configurable on a per installation basis.

⁵ the **ProgramData** folder may be hidden by policy settings.

⁶ this folder hierarchy may be created with **Windows Explorer** if it does not exist.

B Notes for Windows 7 users

These notes are reproduced from

http://cran.r-project.org/bin/windows/base/rw-FAQ.html#Does-R-run-under-Windows-Vista_003f, please visit the FAQ for recent changes.

2.24 Does R run under Windows Vista/7/8/Server 2008?

It does. A few issues have been reported that are related to the way accounts and file permissions work. (These are not specifically R issues, but changes in user experiences.)

Earlier versions of Windows had user and Administrator accounts, and user accounts could be give administrative privileges (by being added to the local Administrators group) and so write permission over system areas such as `c:\Program Files`. R would be installed either by a user in his own file space or by an account with administrator privileges into a system area. Sysadmins could set policies for user accounts, and you might for example have needed to be a ‘Power User’ to install software at all.

Vista and later normally disable the Administrator account and expect software installation to be done by an account which is in the local Administrator group with ‘admin approval mode’ turned on. (The Administrator account by default has it turned off.) Unlike (say) Windows XP, such accounts do not run programs with full administrator privileges, and this is where the issues arise. (For background information consult e.g.

<http://windowsvistablog.com/blogs/windowsvista/archive/2007/01/23/security-features-vs-convenience.aspx>.)

These OSes have the concept of ‘over-the-shoulder’ credentials: if you are running without full administrator privileges and do something which needs them you may be prompted with one or more security-check dialog boxes, and may be required to provide administrator credentials or confirm that you really want to take that action.

Vista and later will report that the R installer has an ‘unidentified publisher’ or ‘unknown publisher’ and ask if it should be run. System administrators can disable installing applications from non-trusted sources, in which case you will have to persuade them that R is trustworthy, or digitally sign the R installer yourself, or (unless this is also disabled) run the installer from a standard account and install into your own file area. (The same issues apply to the .msi version of the installer.)

If you install R as a standard user into your own file space and use it under the same account, there are no known permission issues.

If you use the default Administrator account (without ‘admin approval mode’ being turned on) and install/update packages (in the system area or elsewhere), no issues are known.

If you use an account in the local Administrators group in ‘admin approval mode’ (which is the intended norm under these OSes), installation will make use of ‘over-the-shoulder’ credentials. You will run into problems if you try installing (including updating) packages in the main R library. (It would be nice if at that point R could use over-the-shoulder credentials, but they apply to processes as a whole. Vista and later disallow creating .dll files in the system area without credentials.) There are several ways around this.

Run R with Administrator privileges in sessions where you want to install packages. (Do so by right-clicking on the R shortcut and selecting ‘Run as Administrator’.) Transfer ownership of the R installation to the user which installed R. To do so, use the security tab on the Properties of the top-level R folder and give ‘Full Control’ over this directory to the user (not just the Administrator group). Install packages into a different library tree owned by the account used to install R. For an installation to be used by a single user, the simplest way is to make use of a ‘personal library’: See *I don't have permission to write to the R-3.0.1\library directory*.

For a site installation, you can create a site-wide library directory anywhere convenient, and add it to the default package search path for all users via `R_LIBS_SITE` in `etc\Renviron.site`. See *What are HOME and working directories?*. There is a standard location for a site library, the site-library directory in the top-level R folder (which you would need to create with full control for the R installation account). This will be used for installation in preference to the main library folder if it exists.

This approach will not allow you to update the recommended packages unless you ‘Run as administrator’: we suggest you use an R session running under Administrator privileges when updating those.

Another issue with Vista was that the standard POSIX ways that R uses (e.g. in `file.info` and `file.access`) to look at file permissions no longer work reliably. `file.access` was re-written to work with Windows NT-based security and the new version seems much more reliable with these OSes (but still not 100% correct).

On suitably recent hardware Vista and later can prevent the execution of code from data areas via ‘Data Execution Prevention’ (from a tab in System Properties -> Advanced -> Performance), and sysadmins can turn this on for all programs. R runs correctly with DEP enabled.