

ASReml-R Installation Guide

July 2, 2010

1 Overview

The ASReml RTM function library and precompiled binaries are available for

- Linux i86 and x86_64 systems
- Apple Macintosh i86 and x86_64 systems
- Microsoft WindowsTM i86 systems

ASReml-R is distributed as an R binary package and installs in an R library tree. Installing asrem1 in R involves four main steps:

1. Installing the [ASReml package](#),
2. Setting [environment variables](#) (optional on Windows systems),
3. [Calling asrem1](#) (that is, fitting a linear model) to generate a license registration file, and
4. Installing a valid [license key](#)

1.1 Licensing

Use of the compiled routines requires a license key that must be obtained from [VSN International](#). This will restrict usage to a specified machine, group of machines, or network. On Microsoft Windows systems, asrem1 will generate a demonstration key that is valid for 30 days. On all systems, a file *asrem1Register.txt* is created that contains information necessary to generate the license key; the details

in this file must be completed and sent to [VSN](#). On receipt of a license key, it must then be [installed](#) correctly for the license manager to use it.

2 Installing ASReml

2.1 Microsoft Windows

The asreml functions and compiled code are assembled as an R binary package in *zip* format, `asreml_x.xx.zip`, where *x.xx* is a 3 digit version number. One of

- Install packages from local zip files on the Packages menu in the RGui
- The `install.packages()` function
- The batch processing command `R CMD INSTALL package`

can be used to install from the asreml archive. The first option will install asreml in the default library tree, and is likely the most convenient for most users. **Note** that with Vista and Windows 7 you will need administrator rights to install asreml in the default system location.

1. Initiate an R session using `Rgui.exe`
2. Choose the Packages menu from the main window bar
3. Choose Install packages from local zip files from the Packages menu
4. Navigate to the location of the asreml R package file `asreml_3.00.zip`
5. Select the archive name and click Open to install asreml in the default R library tree
6. 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.

2.2 Linux systems

ASReml is distributed as a binary package in *tar.gz* form, `asreml_3.0.1_R_gg-fedora12-i686.tar.gz`, for example, where *gg* is the version of the asreml shared library, *fedora12* is the operating system under which the shared library has been built, and *i686* indicates the target hardware architecture. Packages for 64 bit systems are identified by the string *x86_64* while *i686* denotes a 32 bit build.

1. Login as a user with write permission to the target `asreml` directory; this is typically a subdirectory in an R library tree.

2. 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`, if this is set (and non-null), and into the default R library tree (for example, `/usr/lib/R/library` or `/usr/lib64/R/library`), otherwise.

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

4. 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
```

2.3 Apple Macintosh systems

ASreml-R can be installed manually on Mac systems by following the above steps for Linux:

- noting that the default installation location will be under the `Frameworks` folder, and
- disregarding the notes on SELinux.

Alternatively, `asreml` can also be installed from the R GUI.

3 Environment settings

The environment variable `ASREML_LICENSE_FILE` (Linux and Mac systems, and optional for Windows) must be set for the license manager to locate the license file.

Additionally, the environment variable `LD_LIBRARY_PATH` on Linux, or `DYLD_LIBRARY_PATH` on Mac installations, or equivalent mechanisms, will need to be set for the dynamic linker to resolve `asreml` dependencies.

3.1 Windows systems

If the license key `asreml.lic` is not copied to the [default location](#), the environment variable `ASREML_LICENSE_FILE` must be set to the fully qualified pathname of this file.

Environment variables can be set from the Start Menu by selecting Start → Control Panel → System and choosing the Advanced tab.

For example, if `asreml.lic` is copied to the user folder `d:/MyLicenses`, then set `ASREML_LICENSE_FILE` to `d:/MyLicenses/asreml.lic`

3.2 Linux systems

The license manager `libv1.so` contains `asreml` dependencies which must be resolved; the path to this file, installed in the `libs` subdirectory of the `asreml` library tree, must be available to the dynamic linker. This can be done either through the `LD_LIBRARY_PATH` environment variable or an entry in the file `/etc/ld.so.conf` (if supported).

The environment variable `ASREML_LICENSE_FILE` must contain the fully qualified path to the license file `asreml.lic` provided by VSN International. This file can reside on any accessible file system.

- These environment variables could be set on a per user basis at login by adding the following to the appropriate (for your shell) start-up script:

```
ASREML_LICENSE_FILE=<lic-path>/asreml.lic
export ASREML_LICENSE_FILE
LD_LIBRARY_PATH=$LD_LIBRARY_PATH:<lib-path>/asreml/libs
export LD_LIBRARY_PATH
```

where *lic-path* is the full path to the directory containing the file `asreml.lic`, and *lib-path* is the path to the root of the `asreml` installation tree.

- Alternatively, either or both environment variables could be set on a per session basis by including the above lines in the R start-up script, which typically resides in `/usr/bin`. This approach is not recommended as the R start-up script is overwritten by each new R installation, and there is also a copy of the R script in `R_HOME/bin`.
- The path to the shared libraries may also be set by including it in the `/etc/ld.so.conf` file. To do this you will need root privileges:
 - Edit the file `/etc/ld.so.conf` to add an entry for `<lib-path>/asreml/libs`
 - Run `/sbin/ldconfig` to update the environment

3.3 Apple Macintosh systems

The environment variable `ASREML_LICENSE_FILE` can be set as above for Linux systems to export the location of the license file.

License manager dependencies are statically linked to `asreml` on these systems, however, the path to the R shared library `libR.dylib` is not embedded in the `asreml` executable and should be set using the `DYLD_LIBRARY_PATH` environment variable.

Assuming a default installation of R, this may look like

```
DYLD_LIBRARY_PATH=/Library/Frameworks/R.framework/Versions/2.11/Resources/lib
```

depending on the version of R installed.

Similarly to Linux, both variables can be set and exported in a shell start-up file, such as `.bash_profile`.

4 Obtaining and installing the `asreml` license

An `asreml` license can be obtained from VSN by completing and emailing the file `asremlRegister.txt` to [VSN](#). You must attempt to [fit a model](#) by calling the `asreml` function for the registration file to be created (in the current working directory).

4.1 Microsoft Windows systems

In the absence of a license file, calling `asreml()` will generate a demonstration license which will remain valid for 30 days. Upon receipt of the license file (`asreml.lic`),

- saving it in the default location
`c:/Program Files/Common Files/VSN International/Licenses/`
requires no further action.
- otherwise, the environment variable `ASREML_LICENSE_FILE` must be set.

4.2 Linux and Macintosh systems

ASReML will not generate a demonstration license on Linux or Mac systems. On receipt of the license file (`asreml.lic`), save it to a convenient location and ensure the environment variable `ASREML_LICENSE_FILE` is set correctly.

4.3 Troubleshooting license problems

All license manager failures are currently reported in the R console when an `asreml()` job is executed. Assuming a valid license, any problems are usually related to the inability of the license manager to locate the license file; check the setting of

the environment variable `ASREML_LICENSE_FILE`, or the default location (Windows only) in such cases. Valid license details are returned in the `license` component of the `asreml` object.

5 Testing the Installation

Running a simple model fit will

- generate a license registration file in the absence of a license key, or
- verify that the software and license are installed correctly.

For example, a simple analysis of the oats data can be run as follows:

```
> library(asreml)
> data(oats)
> oats.asr <- asreml(fixed = yield ~ Variety+Nitrogen+Variety:Nitrogen,
+                  random = ~Blocks + Blocks:Wplots, data=oats)
> summary(oats.asr)
```

6 Support

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

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