

*IBM SPSS Modeler - Essentials for R:
Installation Instructions*



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Chapter 1. IBM SPSS Modeler - Essentials for R: Installation Instructions

Overview

This document contains the instructions for installing IBM® SPSS® Modeler - Essentials for R.

IBM SPSS Modeler - Essentials for R provides you with tools you need to start using custom R scripts for model building and scoring within the Extension nodes in IBM SPSS Modeler. It includes the IBM SPSS Modeler - Integration Plug-in for R for IBM SPSS Modeler 18.4.0.

To use the R nodes in IBM SPSS Modeler Client, you must have the following components installed on the local machine:

- IBM SPSS Modeler 18.4.0. See the topic [“Install the IBM SPSS Modeler application”](#) on page 1 for more information.
- R environment. See the topic [“Download and install R”](#) on page 2 for more information.
- IBM SPSS Modeler - Essentials for R. See the topic [“Download and install IBM SPSS Modeler - Essentials for R”](#) on page 4.

To use the R nodes with IBM SPSS Modeler Server, you must have the following components installed on the server machine:

- IBM SPSS Modeler Server 18.4.0. See the topic [“Install the IBM SPSS Modeler application”](#) on page 1 for more information.
- R environment. See the topic [“Download and install R”](#) on page 2 for more information.
- IBM SPSS Modeler - Essentials for R. See the topic [“Download and install IBM SPSS Modeler - Essentials for R”](#) on page 4 for more information. The bit rate of IBM SPSS Modeler - Essentials for R that is installed must be the same as the installed version of IBM SPSS Modeler Server.

Notes:

- The Windows installer for IBM SPSS Modeler - Essentials for R is the same for both IBM SPSS Modeler and IBM SPSS Modeler Server. For example, the 64-bit installer for IBM SPSS Modeler - Essentials for R applies to both the 64-bit version of IBM SPSS Modeler and the 64-bit version of IBM SPSS Modeler Server.
- Starting with version 18.2.2, there's no longer a separate IBM SPSS Modeler - Essentials for R installer for Mac. It's part of the default SPSS Modeler installation, and the default R_HOME path is `/Library/Frameworks/R.framework/Resources`. If you use a different path, you must edit the file `config.ini` located under `/Applications/IBM/SPSS/Modeler/<version>/SPSSModeler.app/Contents/ext/bin/pasw.rstats` and change `config.ini` to switch to your `${R_HOME}` path on Mac.

Install the IBM SPSS Modeler application

There are no additional operating system and hardware requirements. The components that are installed with IBM SPSS Modeler - Essentials for R work with any valid IBM SPSS Modeler license.

If you have not already done so, follow the instructions that are provided with the software to install one of the IBM SPSS Modeler applications on the computer where you will install IBM SPSS Modeler - Essentials for R.

Note: If you are using Windows, and are installing IBM SPSS Modeler - Essentials for R on a desktop machine, you must also install IBM SPSS Modeler 18.4.0 on the desktop machine. If you are installing IBM SPSS Modeler - Essentials for R on a server machine, you must also install IBM SPSS Modeler Server 18.4.0 on the server machine.

Download and install R

Version 18.4.0 of IBM SPSS Modeler - Essentials for R requires an installation of R. Version 4.0.4 is recommended. Install R on the computer where you will install IBM SPSS Modeler - Essentials for R.

Prerequisites

The target computer where you will install Essentials for R must have X11. If the target computer has a physical display, then it most likely has X11. The steps that follow describe the process for installing X11, if necessary.

1. Install the X11 client and server

- For Linux distributions that use yum, install the X11 client and server software with:

```
yum groupinstall "X Window System" "Desktop" "Fonts" "General Purpose Desktop"
yum update xorg-x11-server-Xorg
yum install xorg-x11-server-Xvfb.x86_64
```

- For Linux distributions that use apt-get, install the X11 client and server software with:

```
apt-get install xorg xterm
apt-get install xserver-xorg xserver-xorg-core xserver-xorg-dev
apt-get install xvfb
```

2. Install OpenGL

- For Linux distributions that use yum, install OpenGL with:

```
yum install mesa-libGL-devel mesa-libGLU-devel libpng-devel
```

- For Linux distributions that use apt-get, install OpenGL with:

```
apt-get install libgl1-mesa-glx libgl1-mesa-dev libglu1-mesa libglu1-mesa-dev
```

3. Start Xvfb. For more information, see <http://www.x.org/archive/X11R7.6/doc/man/man1/Xvfb.1.xhtml>.

4. Set the `DISPLAY` environment variable. The general form for the `DISPLAY` variable is:

```
export DISPLAY=<Hostname>:<D>.<S>
```

In the preceding statement, `<Hostname>` is the name of the computer that hosts the X display server. To specify localhost, omit the value of `<Hostname>`. `<D>` is the display number of the Xvfb instance. `<S>` is the screen number, which is typically 0.

Note: The `DISPLAY` environment variable must be set before you start the IBM SPSS Modeler server.

5. 4.0.4 is the recommended R version. Note that the versions of zlib, bzip2, xz, and pcre that were included with old versions of R have been removed. So if you choose to install R from source, you must install the dependent packages zlib, bzip2, xz, pcre, and curl. You must also set the shared library path by adding the following line to the `.bash_profile` for the user who runs R or `/usr/local/lib/etc/ld.so.conf`.

```
export LD_LIBRARY_PATH=/usr/local/lib:$LD_LIBRARY_PATH
```

For more information, see the *R Installation and Administration* manual at <https://www.r-project.org/>.

- For Linux distributions that use yum, install packages with:
 - yum install zlib zlib-devel
 - yum install bzip2 bzip2-devel
 - yum install xz xz-devel
 - yum install pcre pcre-devel
 - yum install libcurl libcurl-devel

- For Linux distributions that use apt-get, install packages with:
 - apt-get install zlib1g zlib1g-dev
 - apt-get install bzip2 bzip2-dev libbz2-dev
 - apt-get install liblzma-dev
 - apt-get install libpcre3 libpcre3-dev

Note that for libcurl, you can install one of them:

- apt-get install libcurl4-openssl-dev
- apt-get install libcurl4-gnutls-dev
- apt-get install libcurl4-nss-dev

In addition to installing X11, we also recommend installing tcl/tk before installing R.

Installing R from a package manager

Your distribution's repository may include R. If so, you can install R using your distribution's standard package manager (such as the RPM Package Manager or the Synaptic Package Manager).

- For Linux distributions that use yum, you can install R with `yum install R`.
- For Linux distributions that use apt-get, you can install R from the command:

```
apt-get install r-base=<Version> r-base-core=<Version> r-base-dev=<Version>
```

where <Version> is the name of the version. Note that you might need to update the file `/etc/apt/sources.list` to add new sources.

Building and installing R from source

The source for R is available from <ftp://ftp.stat.math.ethz.ch/Software/CRAN/src/base/R-3/>.

1. Create a temporary directory where you will uncompress and unpack the R source. For example, at a command prompt type:

```
mkdir ~/Rsource
```

2. Download the source code for building R, for example `R-4.0.4.tar.gz`, and save it to the temporary directory.

3. Change to the temporary directory. For example, at a command prompt type:

```
cd ~/Rsource
```

4. Uncompress and unpack the R source to the temporary directory. For example, at a command prompt type:

```
tar xzf R-4.0.4.tar.gz
```

5. Change to the source directory. For example, at a command prompt type:

```
cd R-4.0.4
```

Note: To install R to the default directory, you must run the following step as root, either by logging in as root or using the `sudo` command. It is recommended that you read the information in `doc/html/R-admin.html` (located under the directory where you unpacked the R source) before proceeding with configuring, building and installing R.

6. Run the following commands to specify necessary compiler settings (see the special settings for PowerLinux):

```
export CC="gcc -m64"
export CXXFLAGS="-m64 -O2 -g"
export FFLAGS="-m64 -O2 -g"
export FCFLAGS="-m64 -O2 -g"
```

```
export LDFLAGS="-L/usr/local/lib64"
export LIBnn=lib
```

PowerLinux settings:

```
export CC="<XLC_PATH>/bin/xlc_r -q64"
export CFLAGS="-g -O2 -qstrict -qfloat=nomaf:fenv"
export F77="<XLF_PATH>/xlf_r -q64"
export FFLAGS="-g -O3 -qstrict -qfloat=nomaf:fenv -qextname"
export CXX="<XLC_PATH>/bin/xlc_r -q64"
export CPICFLAGS=-qpvc
export CXXPICFLAGS=-qpvc
export FPICFLAGS=-qpvc
export SHLIB_LDFLAGS=-qmksrobj
export SHLIB_CXXLDFLAGS=-G
export FC="<XLF_PATH>/xlf_r -q64"
export FCFLAGS="-g -O3 -qstrict -qfloat=nomaf:fenv -qextname"
export FCPICFLAGS=-qpvc
export CXX1XSTD=-qlanglvl=extended0x
```

Where <XLC_PATH> and <XLF_PATH> are the locations of IBM XL C/C++ for Linux and IBM XL Fortran for Linux respectively.

If installing R on PowerLinux P8LE servers (Ubuntu or RedHat), you must install the XL C/C++ Compiler and the XL Fortran Compiler (16.1.1.12 or later).

Also for PowerLinux, run these commands:

```
xlf -qpreprocess -qnoobject -d src/modules/lapack/dlapack.f
mv -f Fdlapack.f src/modules/lapack/dlapack.f
xlf -qpreprocess -qnoobject -d src/extra/blas/blas.f
mv -f Fblas.f src/extra/blas/blas.f
```

7. Configure, build, and install R. Be sure to configure R with the `--enable-R-shlib` and `--with-x` arguments. For example, at a command prompt type (see the special settings for PowerLinux)::

```
./configure --enable-R-shlib --with-x && make && make install
```

PowerLinux settings:

```
./configure --enable-R-shlib --with-x --with-readline=no --disable-openmp&&
gmake && gmake install
```

For details about building R on IBM z Systems, see <https://github.com/linux-on-ibm-z/docs/wiki/Building-R>.

Note: The `readline` entry is optional, depending on how your system is configured.

Download and install IBM SPSS Modeler - Essentials for R

Be sure to use a version of IBM SPSS Modeler - Essentials for R that is compatible with the version of IBM SPSS Modeler on your machine. Within a major version of IBM SPSS Modeler, such as 18.0, you must use a version of IBM SPSS Modeler - Essentials for R that has the same major version.

For users who are working in distributed mode (with IBM SPSS Modeler Server) please install IBM SPSS Modeler - Essentials for R on the server machine.

Log on to Passport Advantage and download version 18.4.0 of IBM SPSS Modeler - Essentials for R. Be sure to download the version of IBM SPSS Modeler - Essentials for R for the operating system of your IBM SPSS Modeler application.

Tip: After installing IBM SPSS Modeler - Essentials for R, if you ever need to know what version is installed, you can run the following command in the R console.

```
packageVersion("ibmspssc92")
```

Install IBM SPSS Modeler - Essentials for R for Windows

Windows Vista, Windows 7, or Windows Server 2008

You must run the installer as administrator:

1. Using Windows Explorer, browse to the folder where you downloaded the file.
2. Right-click the downloaded file and choose **Run as Administrator**.
3. Follow the instructions that are displayed on the screen.

Pushing an installation

As an alternative to the manual installation described above, you can push the installation to Windows computers. This is most useful for network administrators who need to install to multiple end users. Following is the form of the command line for pushing an installation:

```
<installer_name> -i silent
```

Here, <installer_name> is the name of the installer file for IBM SPSS Modeler - Essentials for R, for example: SPSS_Modeler_REssentials_<version>_win64.exe .

Increasing the memory limit

Under Windows, R imposes a limit on the total memory allocation that is available to an R executable session. This limit restricts the embedded R process `r_start.exe`.

If required, you can modify the numeric value to increase the memory limit; to do this, add an option in the end of the `C:\Program Files\IBM\SPSS\Modeler\<version>\ext\bin\pasw.rstats\config.ini` file. For example, to raise the limit to 4096Mb:

```
Max_Mem_Size=4096
```

Install IBM SPSS Modeler - Essentials for R for UNIX

1. Start a terminal application.
2. Change to the directory where you downloaded IBM SPSS Modeler - Essentials for R. At the command prompt, type:

```
./<<filename>>
```

where <<filename>> is the name of the file you downloaded. You must ensure that this file has execute permission before you attempt to run the command.

Note: You must run the previous command as root, either by logging in as root or (if installing as non-root) by using the `sudo` command and having write permission to <SPSS Modeler installation directory>/ext/bin and <USER_R_HOME>. In addition, you need to install the `gcc` and `gfortran` compilers before you install IBM SPSS Modeler - Essentials for R.

3. Follow the instructions that are displayed on the screen. When prompted for the location of R, you can obtain the R home directory by running `R.home()` from the R prompt.

Note: To ensure that SPSS Modeler can launch R successfully, export the library search paths that are required by `libR.so` to the `DLLIBPATH` variable in the `modelersrv.sh` file in the SPSS Modeler Server installation directory. To find all the `libR.so` libraries that are referenced, use the command `ldd <R_HOME>/lib/libR.so`.

IBM SPSS Modeler - Essentials for R for Mac

Starting with version 18.2.2, there's no longer a separate IBM SPSS Modeler - Essentials for R installer for Mac. It's part of the default SPSS Modeler installation, and the default `R_HOME` path is `/Library/Frameworks/R.framework/Resources`. If you use a different path, you must edit the file `config.ini` located under `/Applications/IBM/SPSS/Modeler/<version>/SPSSModeler.app/Contents/ext/bin/pasw.rstats` and change `config.ini` to switch to your `$(R_HOME)` path on Mac.

Silent installation

As an alternative to the manual installations described previously, you can also run a silent installation. This is most useful for network administrators who need to install to multiple end users. To run a silent installation, do the following:

1. Start a terminal application.
2. Change to the directory where you downloaded IBM SPSS Modeler - Essentials for R.
3. Using a text editor, create a response file named `install.properties`.
4. Add the following properties and associated values to the response file:

```
USER_INSTALL_DIR=<R 4.0.4 home directory>
FRONTEND_INSTALL_DIR=<IBM SPSS Modeler location>/ext/bin
```

where `<R 4.0.4 home directory>` is the installation location of R 4.0.4 and `<IBM SPSS Modeler location>` is the installation location of IBM SPSS Modeler. For example, on UNIX:

```
USER_INSTALL_DIR=/usr/local/lib/R
FRONTEND_INSTALL_DIR=/usr/IBM/SPSS/ModelerServer/19/ext/bin
```

For example, on Windows:

```
USER_INSTALL_DIR=C:\\Program Files\\R\\R-4.0.4
FRONTEND_INSTALL_DIR=C:\\Program Files\\IBM\\SPSS\\Modeler\\18.4.0\\
\\ext\\bin
```

5. Save `install.properties` to the directory that contains the `.bin` file for IBM SPSS Modeler - Essentials for R and change to that directory.
6. On UNIX, run the installer with the following command:

```
./<installer_name> -i silent
```

where `<installer_name>` is the name of the `.bin` file for IBM SPSS Modeler - Essentials for R. Note that you must run the previous command as root, either by logging in as root or using the `sudo` command.

On Windows, run the installer with the following command:

```
<installer_name> -i silent
```

where `<installer_name>` is the name of the installer file for IBM SPSS Modeler - Essentials for R, for example `SPSS_Modeler_REssentials_<version>_win32.exe`.

Alternatively, on UNIX, you can run the installer with the following command:

```
./<installer_name> -f <Response file location>
```

On Windows, you can run the installer with the following command:

```
<installer_name> -f <Response file location>
```

In both cases, <Response file location> is the file path to the response file. If you use this alternative command, you must add the following property to the response file:

```
INSTALLER_UI=[swing | console | silent]
```

Note: To use a different response file (other than `install.properties`), on UNIX run the installer with the following command:

```
./<installer_name> -i silent -f <response file name>
```

On Windows, run the installer with the following command:

```
<installer_name> -i silent -f <response file name>
```

Running Extension nodes in IBM SPSS Modeler Solution Publisher and IBM SPSS Collaboration and Deployment Services

If you want to run Extension nodes (formerly R nodes) in SPSS Modeler Solution Publisher and run the Scoring Service on the IBM SPSS Collaboration and Deployment Services server, you must install IBM SPSS Modeler - Essentials for R and the R environment with SPSS Modeler Solution Publisher and the IBM SPSS Collaboration and Deployment Services server.

Running Extension nodes (Extension Export node, Extension Output node, Extension Model node, Extension Transform node, and Extension Import node)

1. For the Extension nodes to work with SPSS Modeler Solution Publisher, install IBM SPSS Modeler - Essentials for R and the R environment on the same machine as the IBM SPSS Collaboration and Deployment Services server. During IBM SPSS Modeler - Essentials for R installation, point to the R environment installation directory and the SPSS Modeler Solution Publisher installation directory.
2. To run the Scoring Service on the IBM SPSS Collaboration and Deployment Services server, you must also install IBM SPSS Modeler - Essentials for R and the R environment on the same machine as the IBM SPSS Collaboration and Deployment Services server. During IBM SPSS Modeler - Essentials for R installation, point to the R environment installation directory and the local IBM SPSS Modeler Server location under the IBM SPSS Collaboration and Deployment Services server installation directory.
3. For R in CDB node execution, after setting up the environment as described in the previous steps, you must also set an environment variable as follows:
 - a. On the IBM SPSS Collaboration and Deployment Services server machine and the IBM SPSS Modeler client machine, create a **system** environment variable called **IBM_SPSS_MODELER_EXTENSION_PATH** that points to the folder that contains the R CDB node `.cfd` and `.cfe` files.
 - b. Make sure both IBM SPSS Collaboration and Deployment Services server and IBM SPSS Modeler client can access this path.
 - c. Restart IBM SPSS Collaboration and Deployment Services server and IBM SPSS Modeler client.

Note: To ensure that R can launch successfully, export the library search paths that are required by `libR.so` to the `DLLIBPATH` variable in the `modelersrv.sh` file in the IBM SPSS Modeler Solution Publisher installation directory. To find all the `libR.so` libraries that are referenced, use the command **ldd <R_HOME>/lib/libR.so**.

Repairing an installation

If you uninstall and then reinstall the IBM SPSS Modeler 18.4.0 application or your R environment, then you must also uninstall and then reinstall version 18.4.0 of IBM SPSS Modeler - Essentials for R.

Uninstalling IBM SPSS Modeler - Essentials for R components

Windows

Remove the following folder and files:

- `ibmspssc84` from `<R 4.0.x home directory>\\library`
- `config.ini` from `<IBM SPSS Modeler location>\\ext\\bin\\pasw.rstats`
- `embeded.dll` from `<IBM SPSS Modeler location>\\ext\\bin\\pasw.rstats`

UNIX

Remove the following folder and files:

- `ibmspssc84` from `<R home directory>/library`
- `config.ini` from `<IBM SPSS Modeler location>/ext/bin/pasw.rstats`
- `libembeded.so` from `<IBM SPSS Modeler location>/ext/bin/pasw.rstats`

