Installing / Building LibSBML

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Sarah Keating
**Systems Biology Markup Language (SBML)** by ajouraku, bbornstein, beshapiro, funa, luciansmith, mhucka, niko-rodrigue, sarahkeating

Looking for the latest version? Download SBML Level 3 Version 1 Core (Release 1 Candidate) specification (2.3 MB)

<table>
<thead>
<tr>
<th>Name</th>
<th>Modified</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent folder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mac OS X</td>
<td>&lt; 17 hours ago</td>
<td></td>
</tr>
<tr>
<td>Linux</td>
<td>&lt; 20 hours ago</td>
<td></td>
</tr>
<tr>
<td>Windows</td>
<td>&lt; 20 hours ago</td>
<td></td>
</tr>
<tr>
<td>libSBML-5.0.0-docs.zip</td>
<td>&lt; 13 hours ago</td>
<td>58.9 MB</td>
</tr>
<tr>
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<td>57.1 MB</td>
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<td>8.5 MB</td>
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<td>12.0 MB</td>
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<tr>
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<td>2.4 KB</td>
</tr>
<tr>
<td>Totals: 8 Items</td>
<td></td>
<td>137.2 MB</td>
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Binary Installers

INSTALLING LIBSBML
Binary Installers

Windows
- `libSBML-5.0.0-win-x64.exe`
- `libSBML Setup`
- `SBML Team`

OS X
- `libSBML-5.0.0-osxml2-snowleopard.pkg`

Linux
- `DEB`
- `rpm`

SBML Team
Windows Installers

libSBML

Welcome to the libSBML Setup Wizard

This will install libSBML 5.0.0 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.

www.sbml.org
Windows Installers
Windows Installers
Windows Installers
Windows Installers

Ready to Install
Setup is now ready to begin installing libSBML on your computer.

Click Install to continue with the installation, or click Back if you want to review or change any settings.

Destination location:
C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64

NOTE: all language binding files will be available in this location

The following additional language interface installation options have been selected:

Installing libSBML MATLAB

Installing libSBML Python 2.7 files to site-packages directory
C:\Python27_64\Lib\site-packages\
Windows Installers
Windows Installers
Windows Installers

Welcome to the libSBML MATLAB Interface Setup Wizard

This will install MATLAB Interface of libSBML 5.0.0 on your computer.

It is recommended that you close all other applications before continuing.

Click Next to continue, or Cancel to exit Setup.

www.sbml.org
Windows Installers
Windows Installers
Once installed

- Language bindings for:
  - Matlab
  - Perl
  - Python

Are available as soon as the interpreter is started. For other bindings some changes are needed ...
Once installed – C++

• INCLUDE
  
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\win64\include
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x86\win32\include

• LIB
  
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\win64\lib
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x86\win32\lib

• Remember to copy DLL files from the binary folder to your application.
Once installed – Java

• Include Jar file in your CLASSPATH
  
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\bindings\java\libsbmlj.jar
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x86\bindings\java\libsbmlj.jar

• Have the native library in the java.library.path

  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\bindings\java\sbmlj.dll
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x86\bindings\java\sbmlj.dll
Once installed – C#

• Reference managed assembly:
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\bindings\csharp\libsbmlcsP.dll
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x86\bindings\csharp\libsbmlcsP.dll

• Copy the native DLL next to your executable
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\bindings\csharp\libsbmlcs.dll
  C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\bindings\csharp\libsbmlcs.dll
OS X Installers
OS X Installers

Welcome to the libSBML MacOSX installer!

This installation package will install libSBML for MacOS 10.5 or later, for both i386 and PPC architectures. By default, it will put the contents in /usr/local, but this location can be changed from the installer interface.

NOTE: Please uninstall any existing copy of libSBML located in the same destination before you install libSBML using this installer, or you may end up with mixed versions of different libSBML components on your system.

This package includes the C/C++ core libSBML library and the following language interfaces:

- C# (Mono)
- Java
- Perl
- Python
- Ruby

The MATLAB and Octave interfaces are currently not included in the MacOSX installer. If you need the MATLAB and/or Octave interface, please compile them directly using the libSBML source code.
OS X Installers

Software License Agreement

Introduction
Read Me
License
Destination Select
Installation Type
Installation
Summary

Licensing and Distribution Terms for libSBML

Copyright © 2009-2011 jointly by the following organizations:
1. California Institute of Technology, Pasadena, CA, USA
2. EMBL European Bioinformatics Institute (EBML-EBI), Hinxton, UK

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Pasadena, CA, USA

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2. Japan Science and Technology Agency, Japan

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WARRANTY OF MERCHANTABILITY OR FITNESS FOR A
OS X Installers

Standard Install on “Macintosh HD”

This will take 182.4 MB of space on your computer.

Click Install to perform a standard installation of this software on the disk “Macintosh HD”.

libSBML-5.0.0-libxml2-snowleopard.pkg
OS X Installers – install location
OS X Installers – install location
OS X Installers
OS X Installers

You are selecting a location for “libSBML 5.0.0”. The size of this item is 182.4 MB. Below is a list of the disks and their available space.

- Macintosh HD: 53.98 GB
- BOOTCAMP: 4.49 GB

New Folder    Standard install    Cancel    Choose
OS X Installers

Type your password to allow Installer to make changes.

Name: Frank Bergmann
Password: [hidden]

Details

Change Install Location...
OS X Installers

The installation was completed successfully.

To uninstall libSBML, please run the following command:

```
sudo /usr/local/bin/uninstall-libsml-pkg.sh
```

(In case you installed libSBML into a directory tree other than /usr/local, then please look for the "uninstall-libsml-pkg.sh" script in the "bin" directory of that alternate location.)

For detailed information about how to make libSBML accessible to your software, please visit

http://sbml.org/Software/libSBML/docs/cpp-api/libsml-accessing.html

Detailed information about libSBML can be found at

http://sbml.org/Software/libSBML

Please report problems using the tracker at

http://sbml.org/Software/libSBML/issue-tracker

Thank you for your interested in SBML!
Once installed

- Language bindings for:
  - Perl
  - Python
  - Ruby

Are available as soon as the interpreter is started. For other bindings some changes are needed ...
Once Installed – C++

• By default the installation directory is `/usr/local/`

• So one would compile with the options

    -I/usr/local/include  -L/usr/local/lib  -lsbml
Once installed – Java

- Include Jar file in your CLASSPATH
  /usr/local/share/java/libsbml.jar

- Have the native library in the java.library.path
  /usr/local/lib/libsbmlj.jnilib
Once installed – C#

• Reference managed assembly:
  /usr/local/lib/mono/libsbmlcsP/libsbmlcsP.dll

• Ensure that the native library is in your applications DYLD_LIBRARY_PATH
  /usr/local/lib/mono/libsbmlcsP/libsbmlcs.dylib
  /usr/local/lib/mono/libsbmlcsP/libsbml1.dylib
Linux packages

• Currently only the C/C++ library is available in the DEB / RPM file.

• Have been created with:
  – Ubuntu 8.04 (DEB)
  – CentOS 4.8 (RPM)
Linux packages

Do you want to install this file?

/home/fbergmann/Downloads/libSBML-5.0.0-Linux-x64.rpm

Help  Close  Install
Linux packages

Authentication is required to install an untrusted package

An application is attempting to perform an action that requires privileges. Authentication as the super user is required to perform this action.

Password for root: 

Details

Cancel  Authenticate
Once Installed – C++

• By default the installation directory is /usr/local/

• So one would compile with the options

  -I/usr/local/include -L/usr/local/lib -lsbml
Using GNUmake / CMake

BUILDING LIBSBML
Building LibSBML

• The installers are created with compression support and using the libXML parser library.

• If the installer does not include your language bindings, or you would like to choose a different parser library you can create your own version.
Prerequisites

• XML Parser library:
  – libXML >= 2.7.3
  – Expat >= 1.95.8
  – Xerces-c >= 2.7.0 (default: libXML2)

• Compression library:
  – Zlib >= 1.2.3 (optional)
  – Bzip2 >= 1.0.5 (optional)

• Language bindings:
  – Swig / Swigwin >= 2.0.0 (optional)

• Documentation
  – Doxygen >= 1.6.3 (optional)

• CMake >= 2.8.4 (optional)
GNUmake

• On Cygwin / OS X / Linux we still supply GNU make files which can be used directly by running:

  ./configure <options>
  make
  sudo make install
GNUmake options

- Installation Prefix
  --prefix=<directory>
- Layout Package
  --enable-layout
- XML Parsers
  --with-expat[=prefix]
  --with-libxml[=prefix]
  --with-xerces[=prefix]
- Compression
  --with-zlib[=prefix]
  --with-bzip2[=prefix]
- Language Bindings
  --with-swig[=prefix]
  --with-csharp[=prefix]
  --with-java[=prefix]
  --with-octave[=prefix]
  --with-matlab[=prefix]
  --with-perl[=prefix]
  --with-python[=prefix]
  --with-ruby[=prefix]
- Documentation
  --with-doxygen[=prefix]
CMake

• LibSBML is beginning to use CMake to make it easy to integrate new packages.

• CMake allows to generate not only make files, but also project files for commonly used IDEs:
  – Code::Blocks, eclipse (CDT), Visual Studio, Xcode
CMake configuration
CMake configuration

Directory with libSBML 5 sources

Directory where binaries, and make files / project files are created
CMake configuration
CMake configuration

Grouping makes it easy to navigate the options
CMake configuration

After all configuration values turned white, a click on ‘Generate’ produces the Project files.
Visual Studio
CMake configuration on OS X

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMAKE</td>
<td></td>
</tr>
<tr>
<td>ENABLE</td>
<td></td>
</tr>
<tr>
<td>ENABLE_LAYOUT</td>
<td></td>
</tr>
<tr>
<td>LIB</td>
<td></td>
</tr>
<tr>
<td>LIBXML_INCLUDE_DIR</td>
<td>/usr/include</td>
</tr>
<tr>
<td>LIBXML_LIBRARY</td>
<td>/usr/lib/libxml2.dylib</td>
</tr>
<tr>
<td>LIBXML_INCLUDE_DIR</td>
<td>/usr/include/libxml2</td>
</tr>
<tr>
<td>LIBXML_LIBRARY</td>
<td>/usr/lib/libxml2.dylib</td>
</tr>
<tr>
<td>LIBZ</td>
<td></td>
</tr>
<tr>
<td>LIBZ_INCLUDE_DIR</td>
<td>/usr/include</td>
</tr>
<tr>
<td>LIBZ_LIBRARY</td>
<td>/usr/lib/libz.dylib</td>
</tr>
</tbody>
</table>

Press Configure to update and display new values in red, then press Generate to generate selected build files.

Using C++ namespace for libxml2 (libxml) = no
Building universal binaries = no (using native arch)

Other potentially important settings:
Compression support is enabled for .zip and .gz files
Compression support is enabled for .bz2 files

Configuring done
CMake configuration on OS X
CMake configuration

- CMake can generate the make files / project files also from the command line:

  cmake -DENABLE_LAYOUT=ON -DWITH_EXAMPLES=ON <libsbml source directory>

Would configure the build with layout extension and examples.
CMake options

• Installation Prefix
  CMAKE_INSTALL_PREFIX= <directory>
• Layout Package
  WITH_LAYOUT=ON
• XML Parsers
  WITH_EXPAT=ON
  WITH_LIBXML=ON
  WITH_XERCES=ON
• Compression
  WITH_ZLIB=ON
  WITH_BZIP2=ON
• Language Bindings
  WITH_SWIG=ON
  WITH_CSHARP=ON
  WITH_JAVA=ON
  WITH_OCTAVE=ON
  WITH_MATLAB=ON
  WITH_PERL=ON
  WITH_PYTHON=ON
  WITH_RUBY=ON
• Documentation
  WITH_DOXYGEN=ON
Installing

- GNU make: sudo make install
- CMake Unix Makefile project: sudo make install
- CMake NMake project: nmake install
- CMake IDE project: select the INSTALL target of your Release configuration and build it.
DOCUMENTATION

http://sbml.org/Software/libSBML/
Acknowledgements

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