

# Installing / Building LibSBML

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Sarah Keating

<http://sf.net/projects/sbml/files/libsbml/5.0.0>

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

Summary Files Reviews Support Develop Tracker Mailing Lists Code Project Admin

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

Add File Add Folder

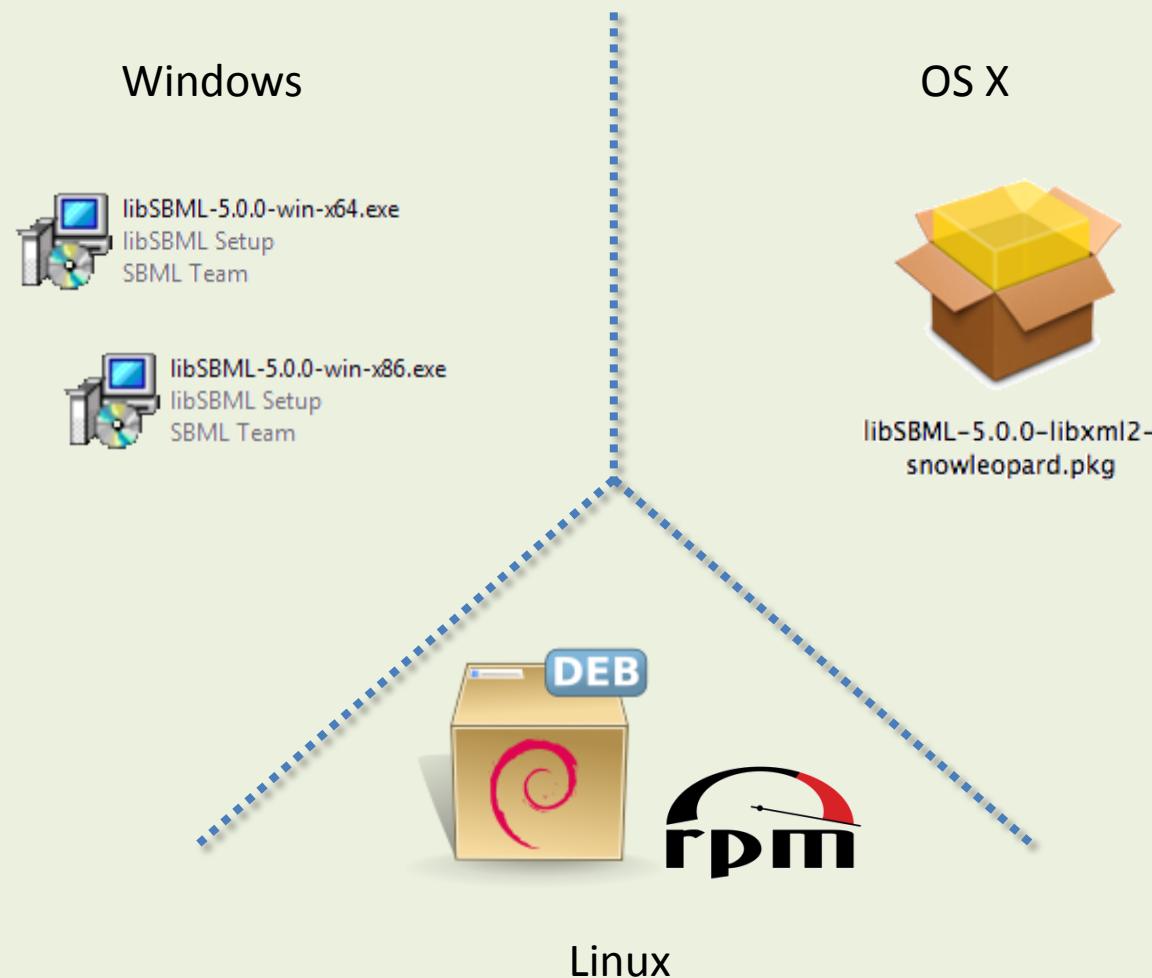
Home / libsbml / 5.0.0

| Name                      | Modified       | Size     | Actions |
|---------------------------|----------------|----------|---------|
| Parent folder             |                |          |         |
| Mac OS X                  | < 17 hours ago |          | i       |
| Linux                     | < 20 hours ago |          | i       |
| Windows                   | < 20 hours ago |          | i       |
| libSBML-5.0.0-docs.zip    | < 13 hours ago | 58.9 MB  | i       |
| libSBML-5.0.0-docs.tar.gz | < 13 hours ago | 57.1 MB  | i       |
| libSBML-5.0.0-src.tar.gz  | < 17 hours ago | 8.5 MB   | i       |
| libSBML-5.0.0-src.zip     | < 17 hours ago | 12.6 MB  | i       |
| README.txt                | < 20 hours ago | 2.4 KB   | i       |
| Totals: 8 Items           |                | 137.2 MB |         |

Binary Installers

# **INSTALLING LIBSBML**

# Binary Installers



# Windows Installers

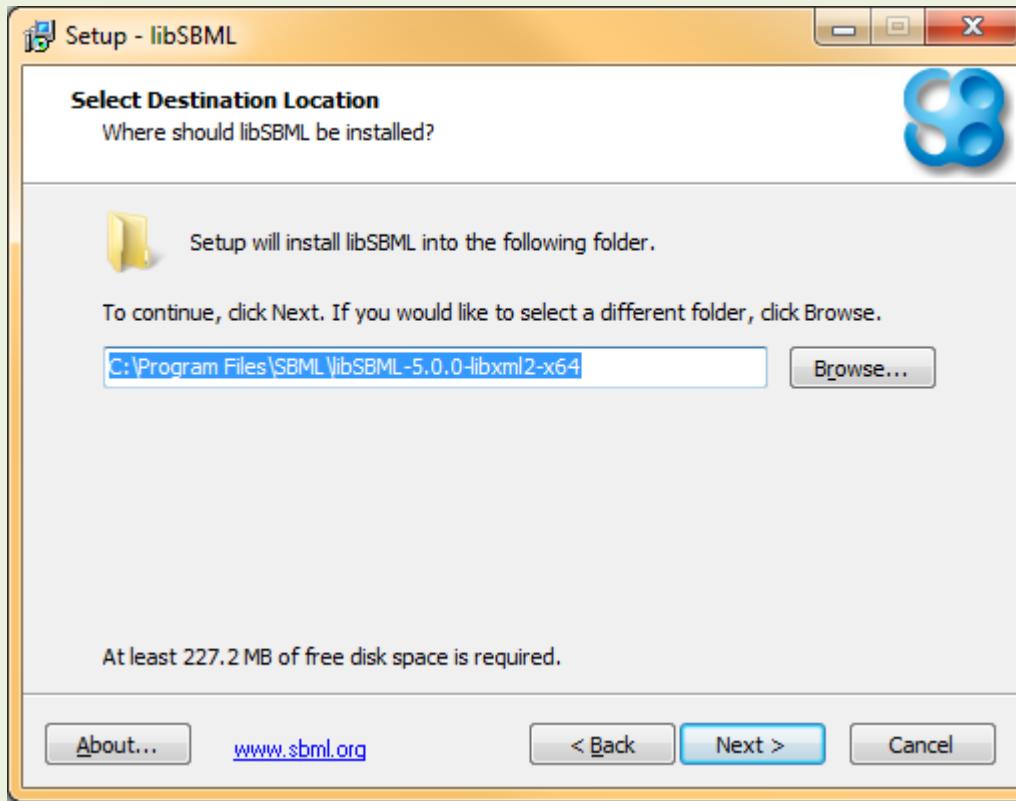


libSBML-5.0.0-win-x64.exe  
libSBML Setup  
SBML Team



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers

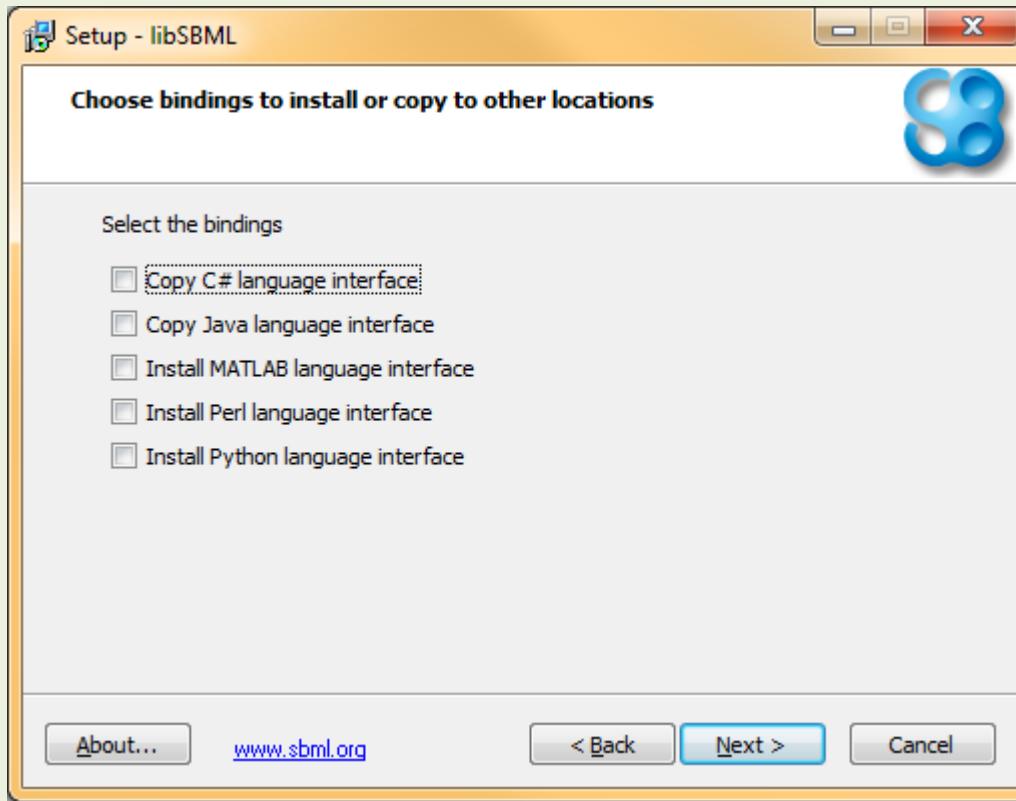


libSBML-5.0.0-win-x64.exe  
libSBML Setup  
SBML Team



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers

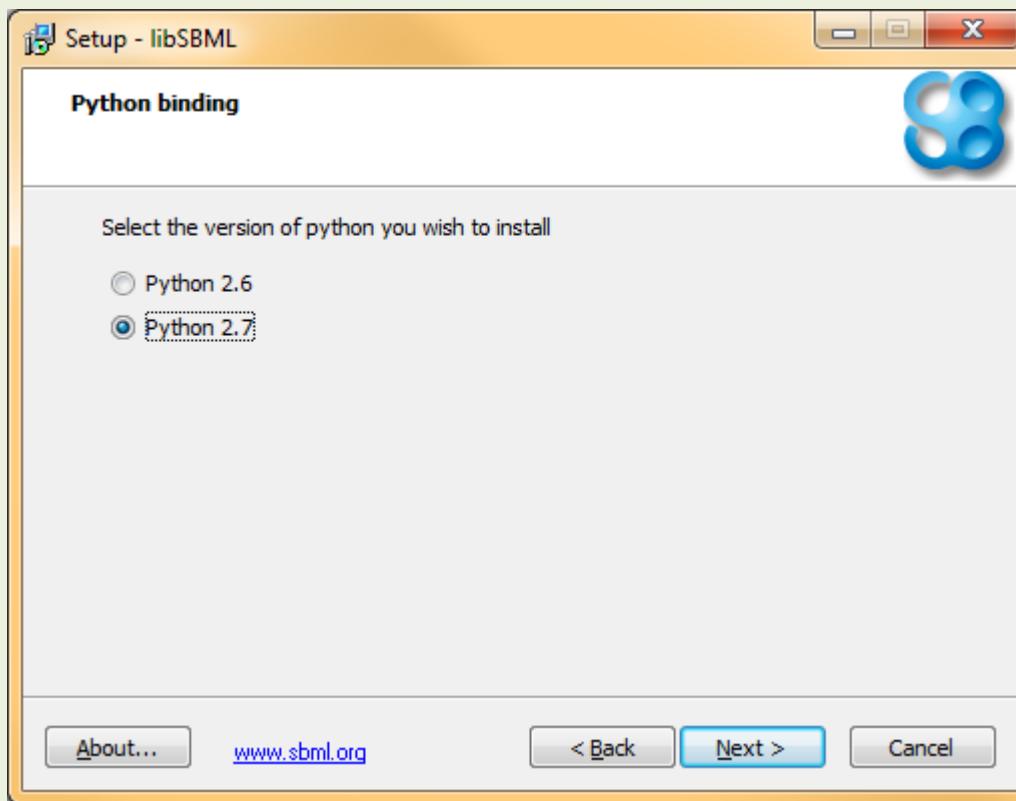


libSBML-5.0.0-win-x64.exe  
libSBML Setup  
SBML Team



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers

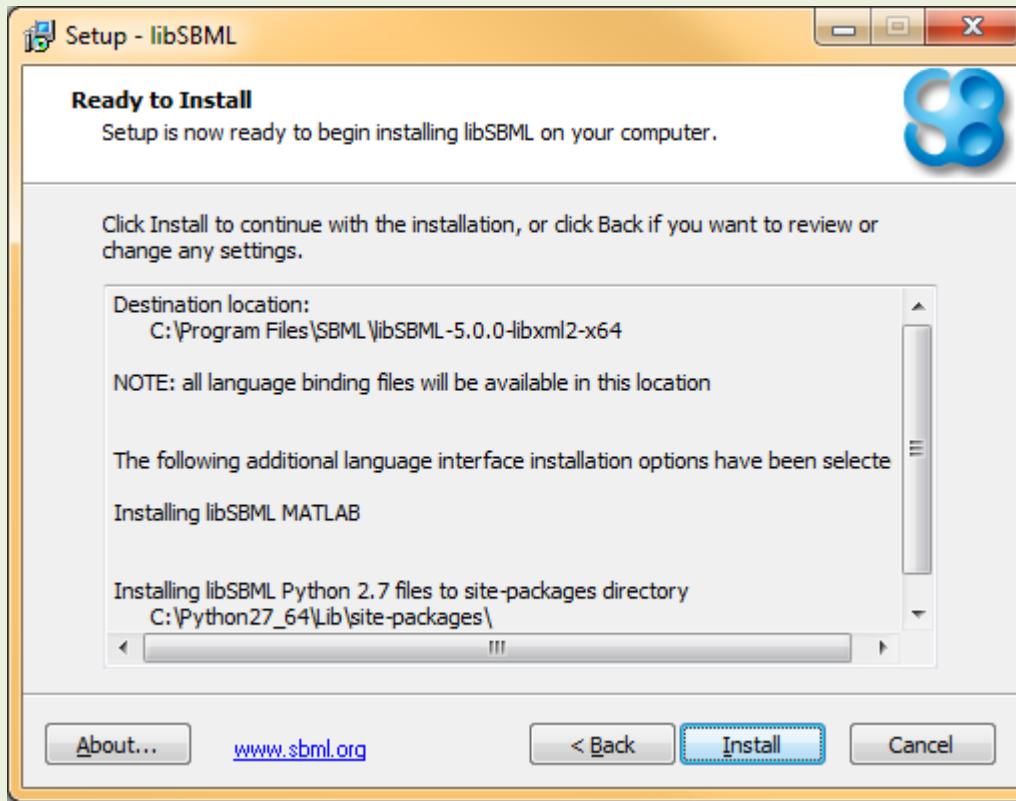


libSBML-5.0.0-win-x64.exe  
libSBML Setup  
SBML Team



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers

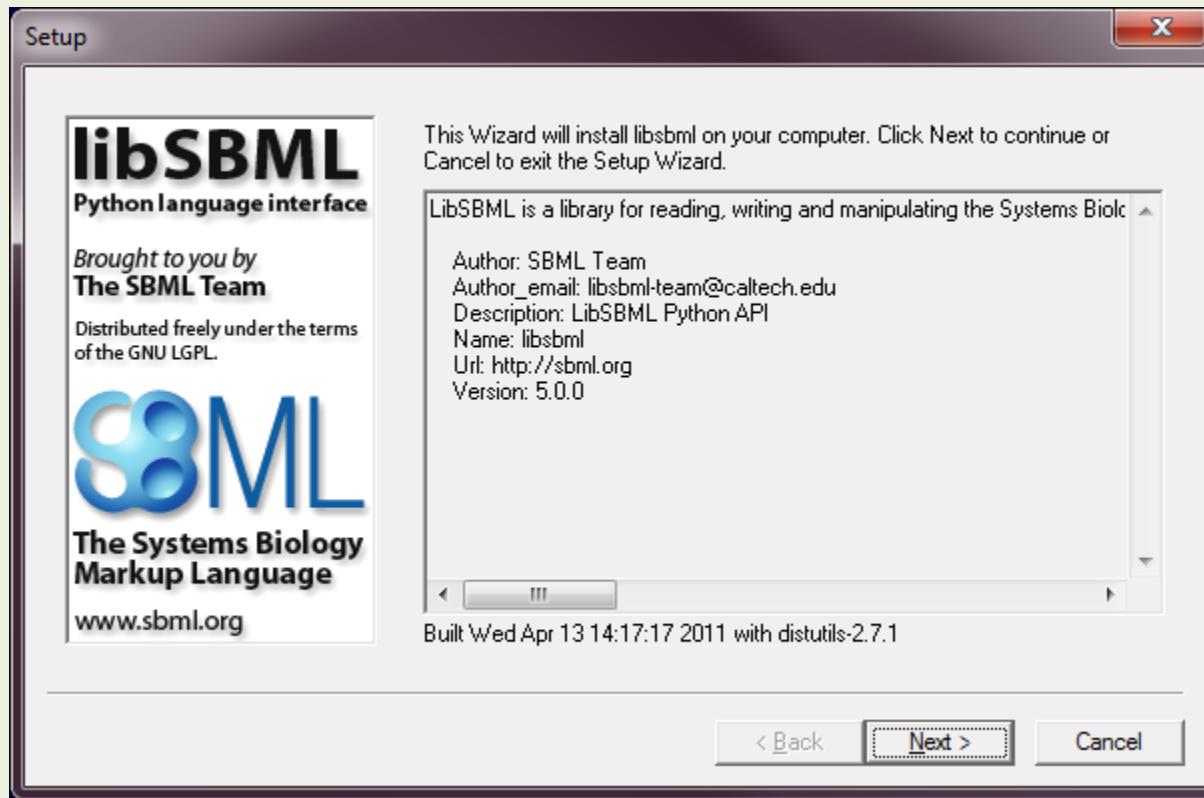


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libSBML-5.0.0-win-x86.exe  
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# Windows Installers

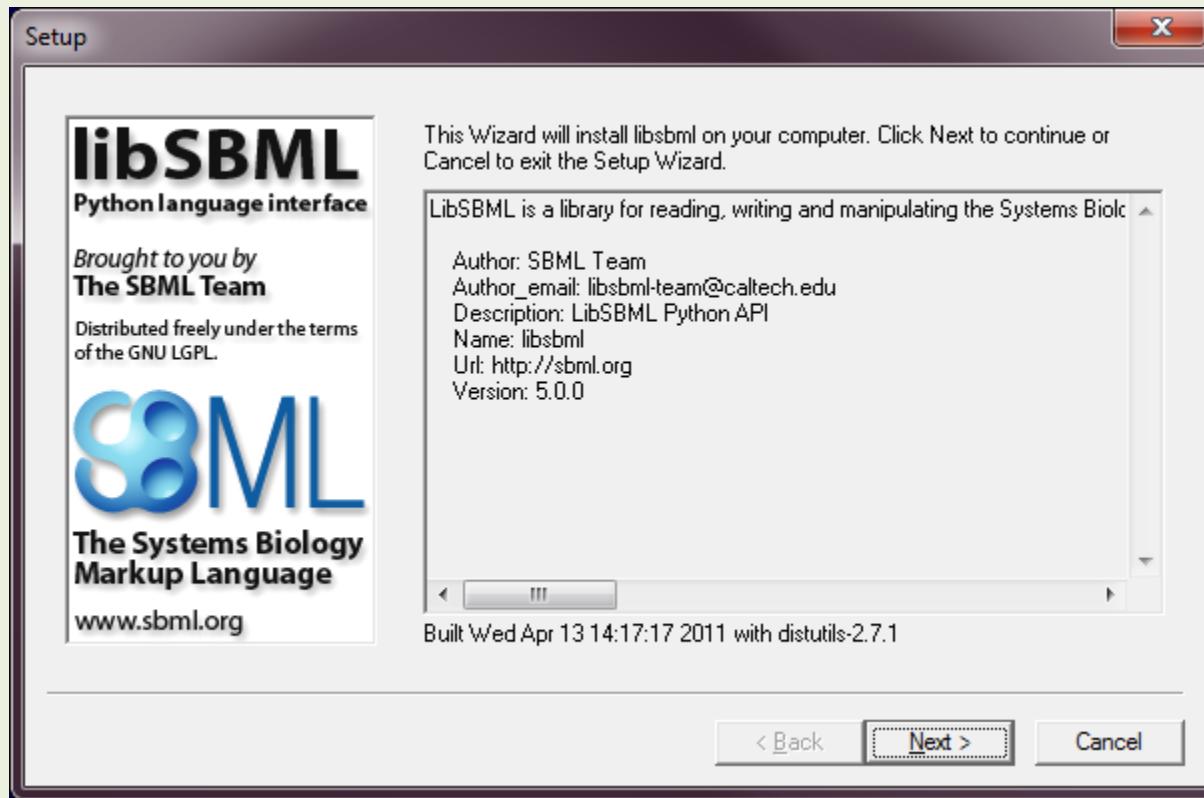


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libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers

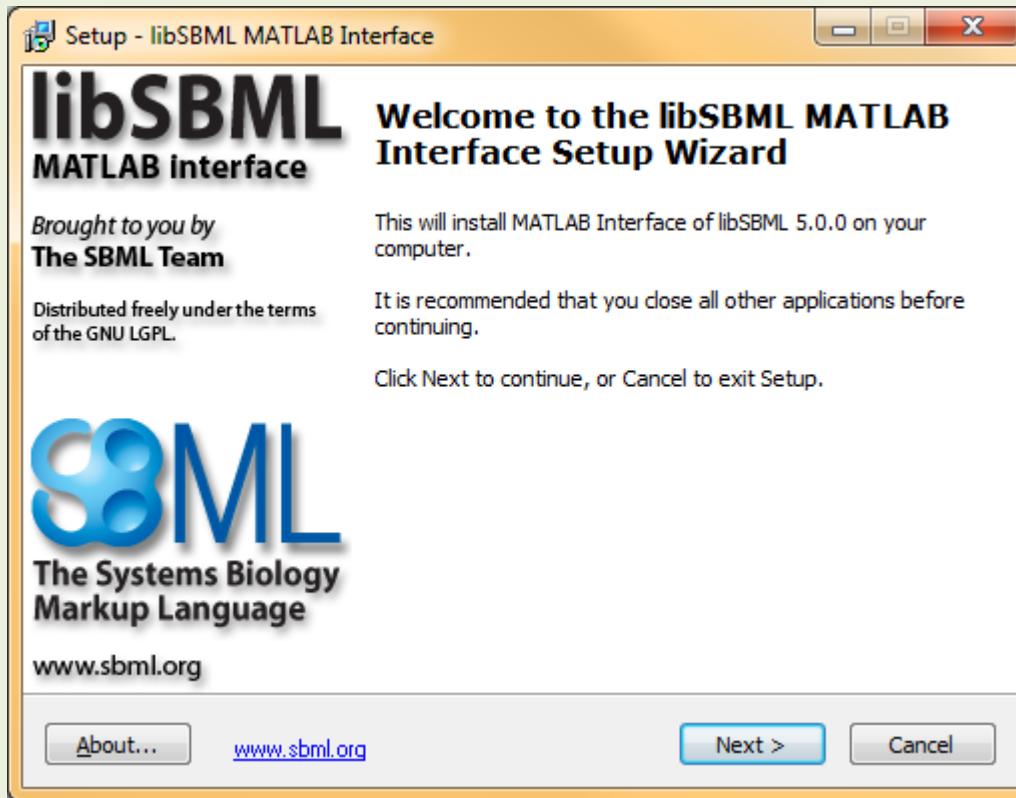


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libSBML Setup  
SBML Team



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers



libSBML-5.0.0-win-x64.exe  
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SBML Team



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers

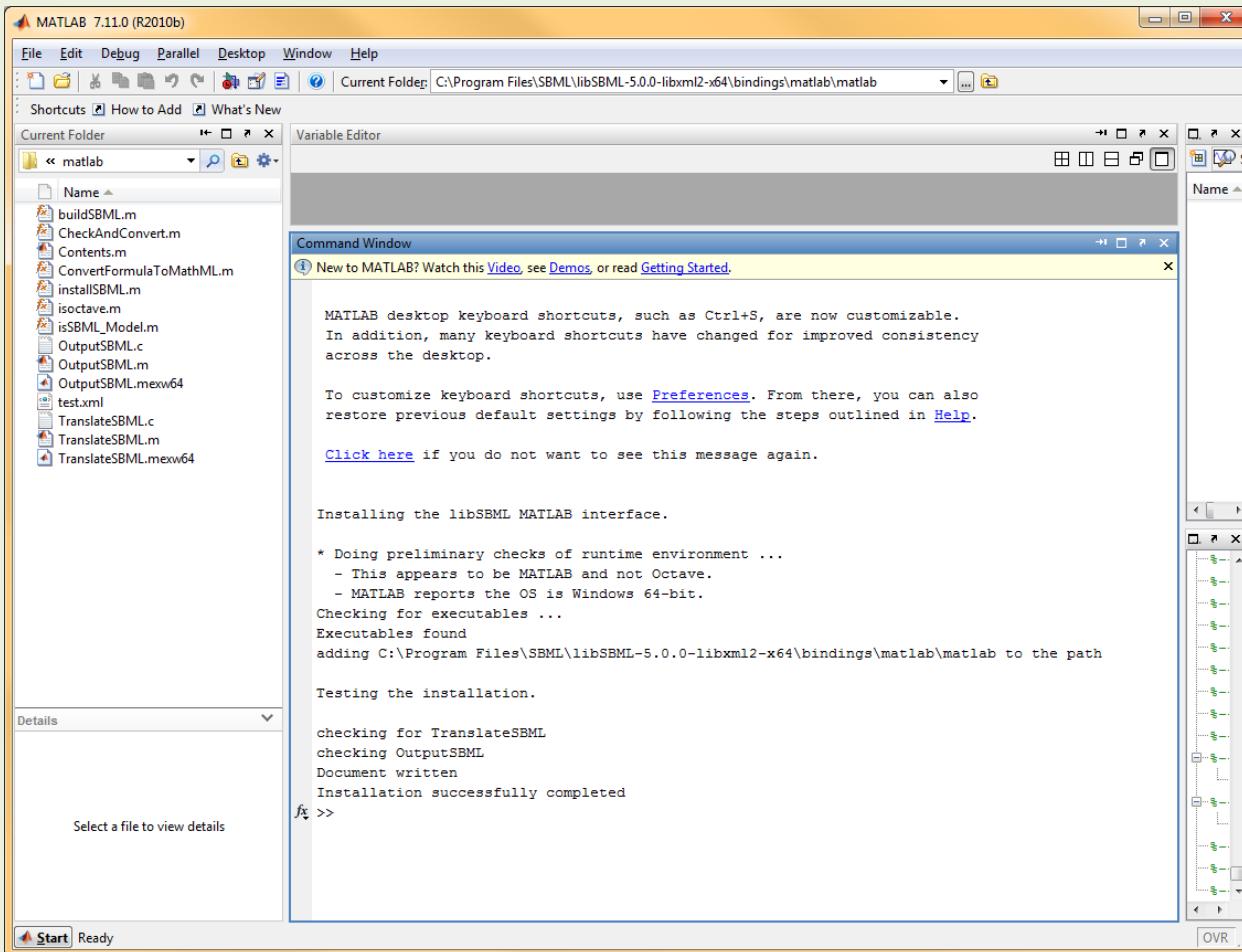


libSBML-5.0.0-win-x64.exe  
libSBML Setup  
SBML Team



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# Windows Installers



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



libSBML-5.0.0-win-x86.exe  
libSBML Setup  
SBML Team

# 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\libsbm1csP.dll  
C:\Program Files\SBML\libSBML-5.0.0-libxml2-x86\  
          bindings\csharp\libsbm1csP.dll
```

- Copy the native DLL next to your executable

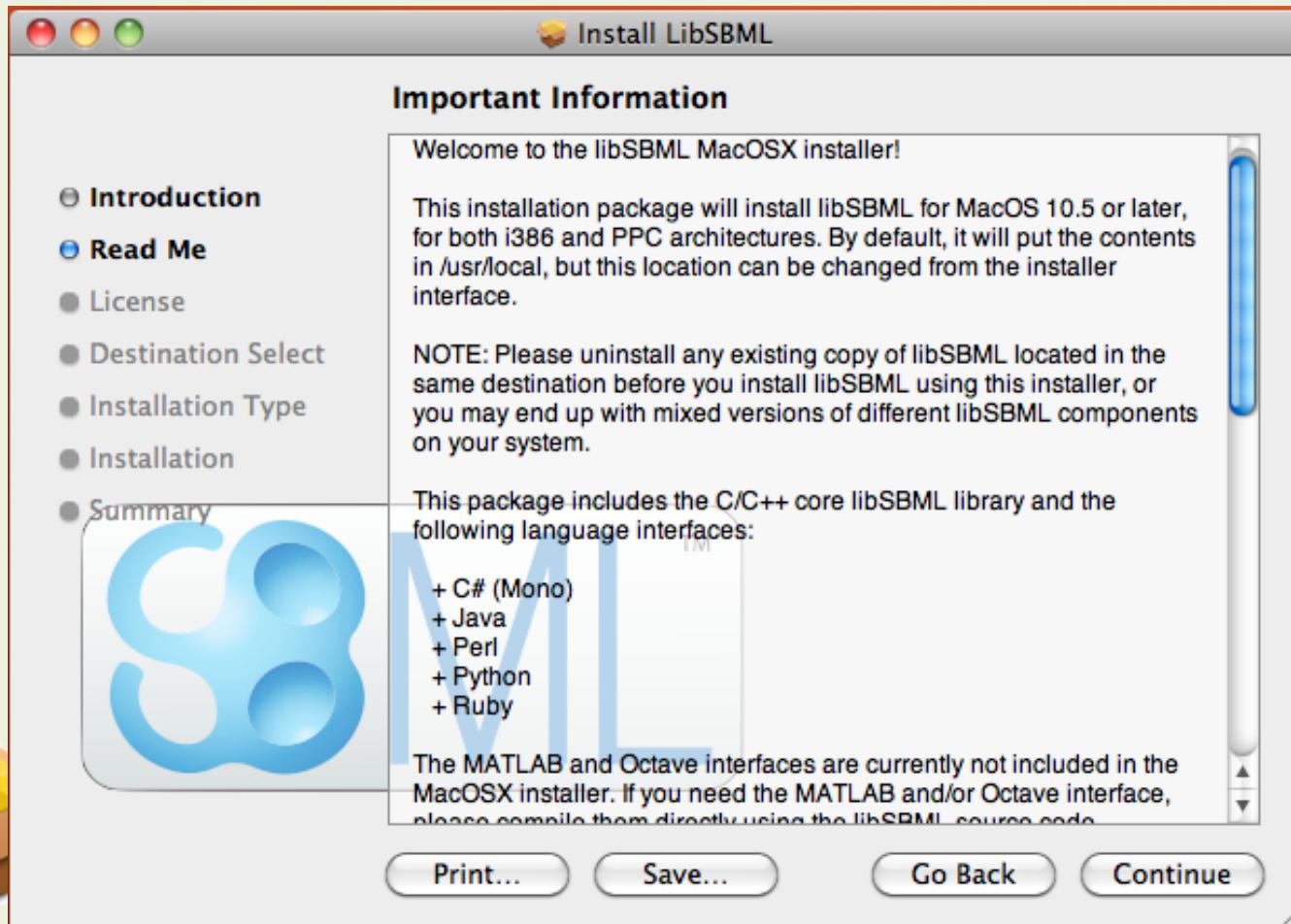
```
C:\Program Files\SBML\libSBML-5.0.0-libxml2-x64\  
          bindings\csharp\libsbm1cs.dll  
C:\Program Files\SBML\libSBML-5.0.0-libxml2-x86\  
          bindings\csharp\libsbm1cs.dll
```

# OS X Installers



libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers



libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers

The screenshot shows a Mac OS X style window titled "Install LibSBML". The window has a title bar with three buttons (red, yellow, green) and the title "Install LibSBML". Below the title bar is a sidebar on the left containing the following items:

- Introduction (radio button)
- Read Me (radio button)
- License (radio button, selected)
- Destination Select (radio button)
- Installation Type (radio button)
- Installation (radio button)
- Summary (radio button)

On the right side of the window, there is a large text area with the following content:

**Licensing and Distribution Terms for libSBML**

English

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

Copyright © 2006-2008 by the California Institute of Technology,  
Pasadena, CA, USA

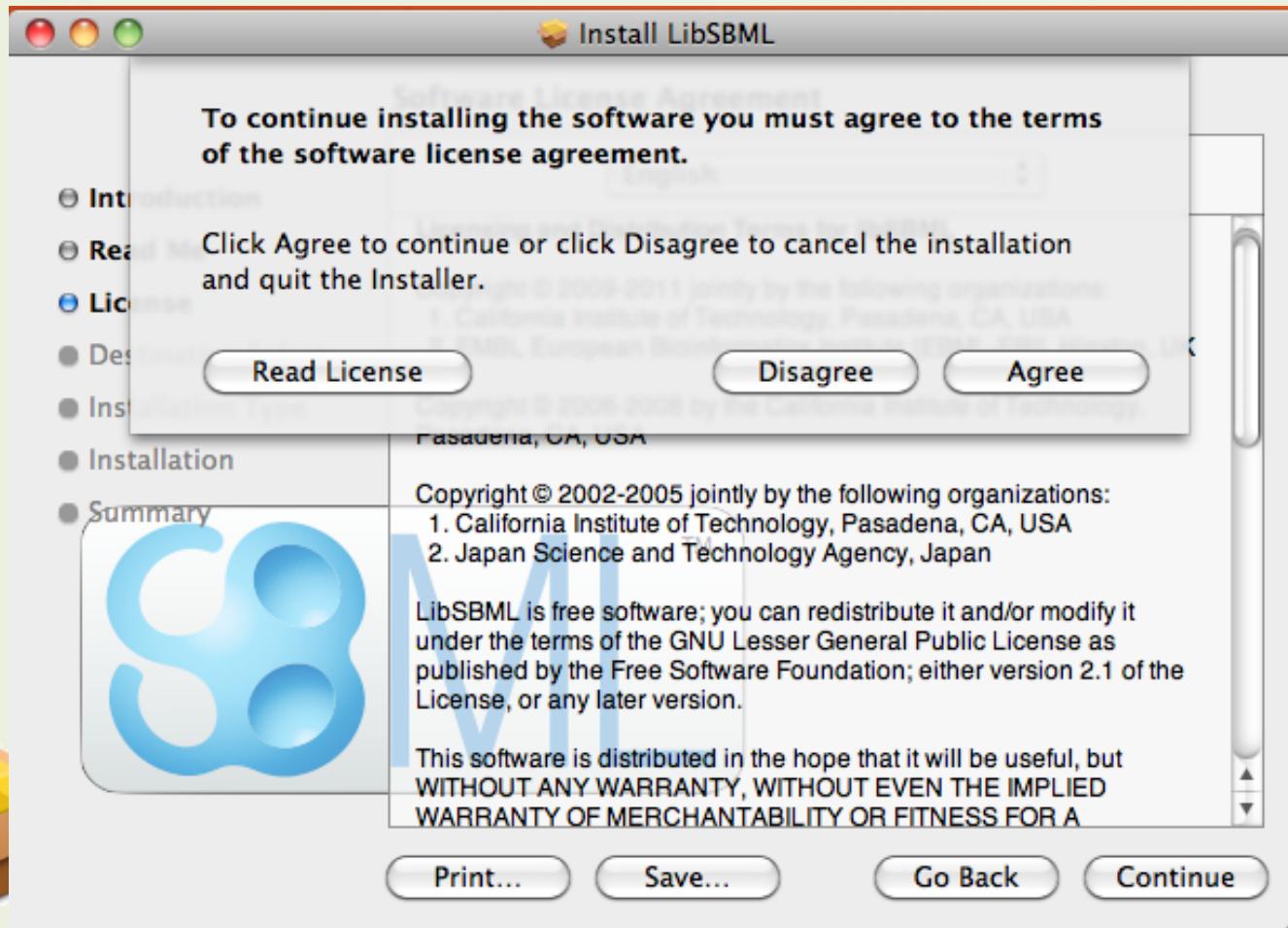
Copyright © 2002-2005 jointly by the following organizations:  
1. California Institute of Technology, Pasadena, CA, USA  
2. Japan Science and Technology Agency, Japan

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This software is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY, WITHOUT EVEN THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A

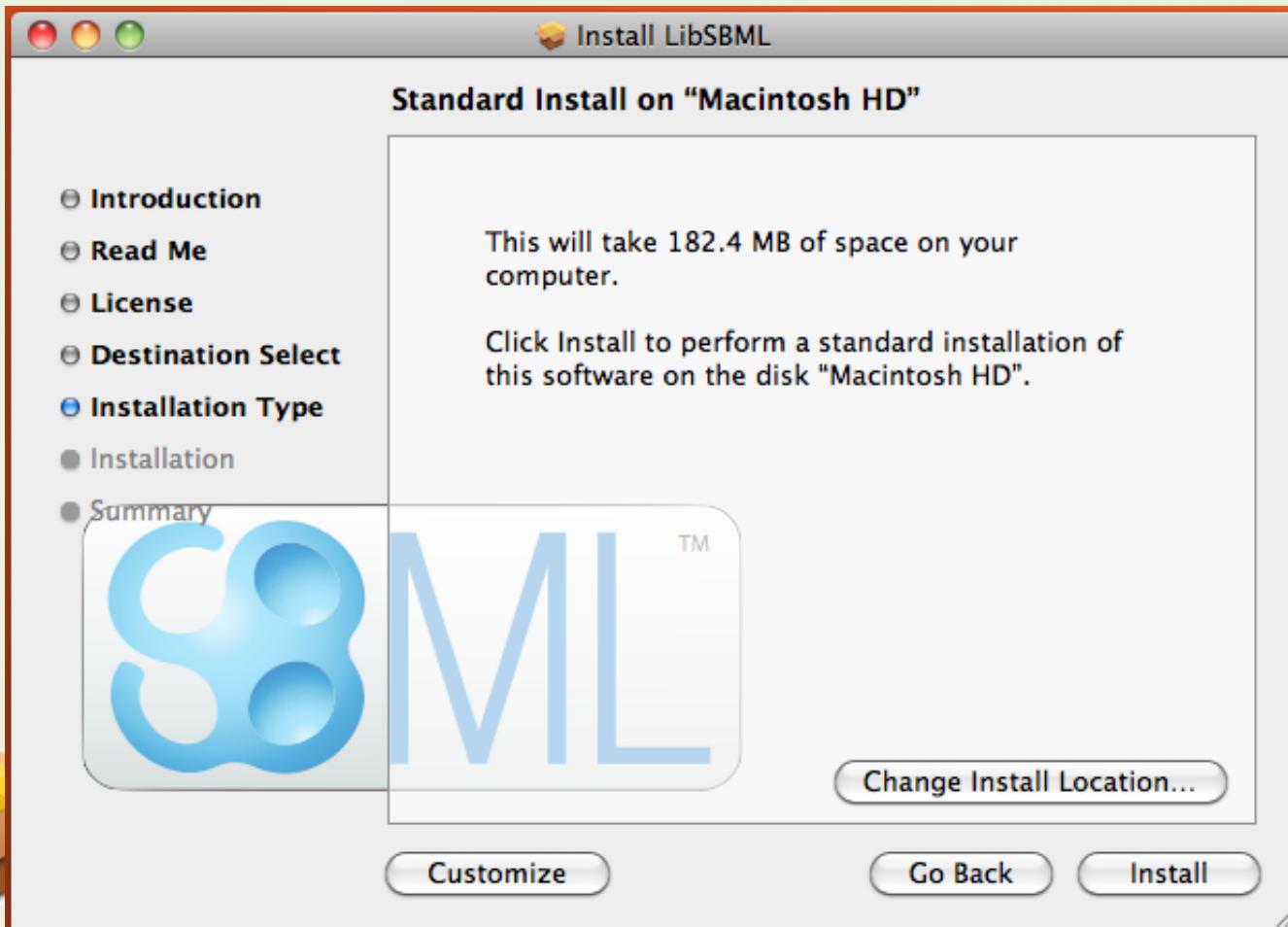
At the bottom of the window are four buttons: "Print...", "Save...", "Go Back", and "Continue".

# OS X Installers



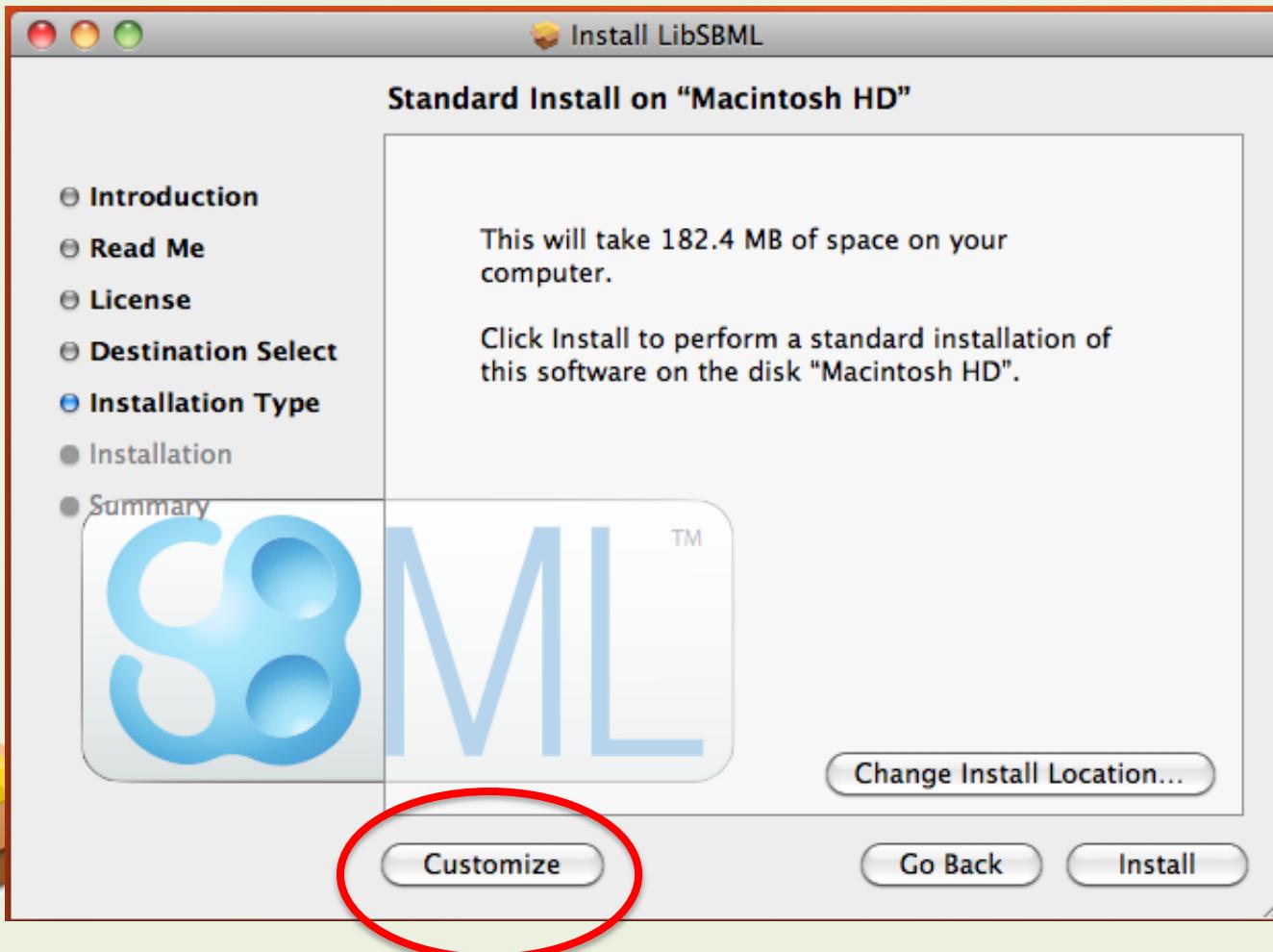
libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers

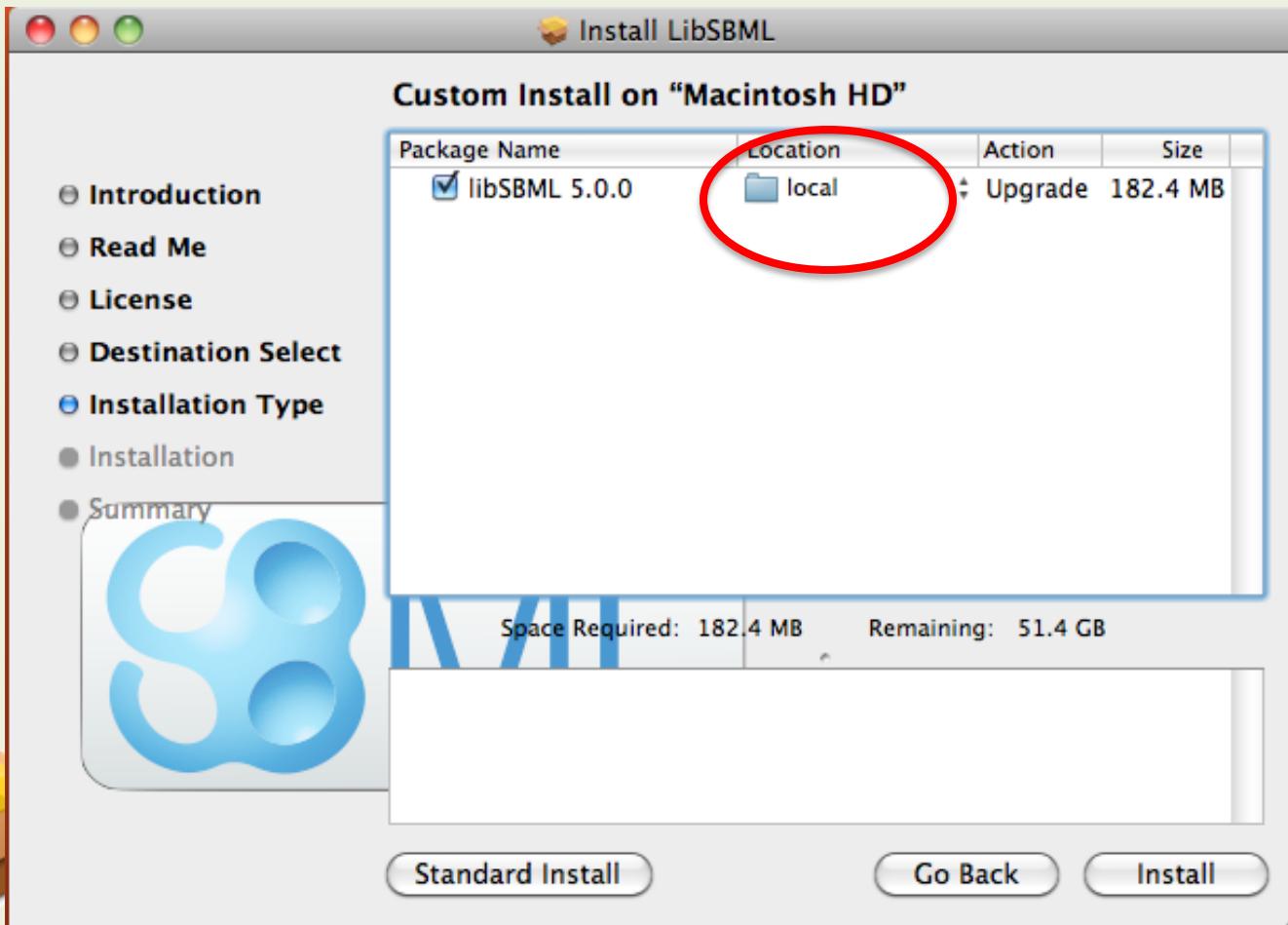


libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers – install location

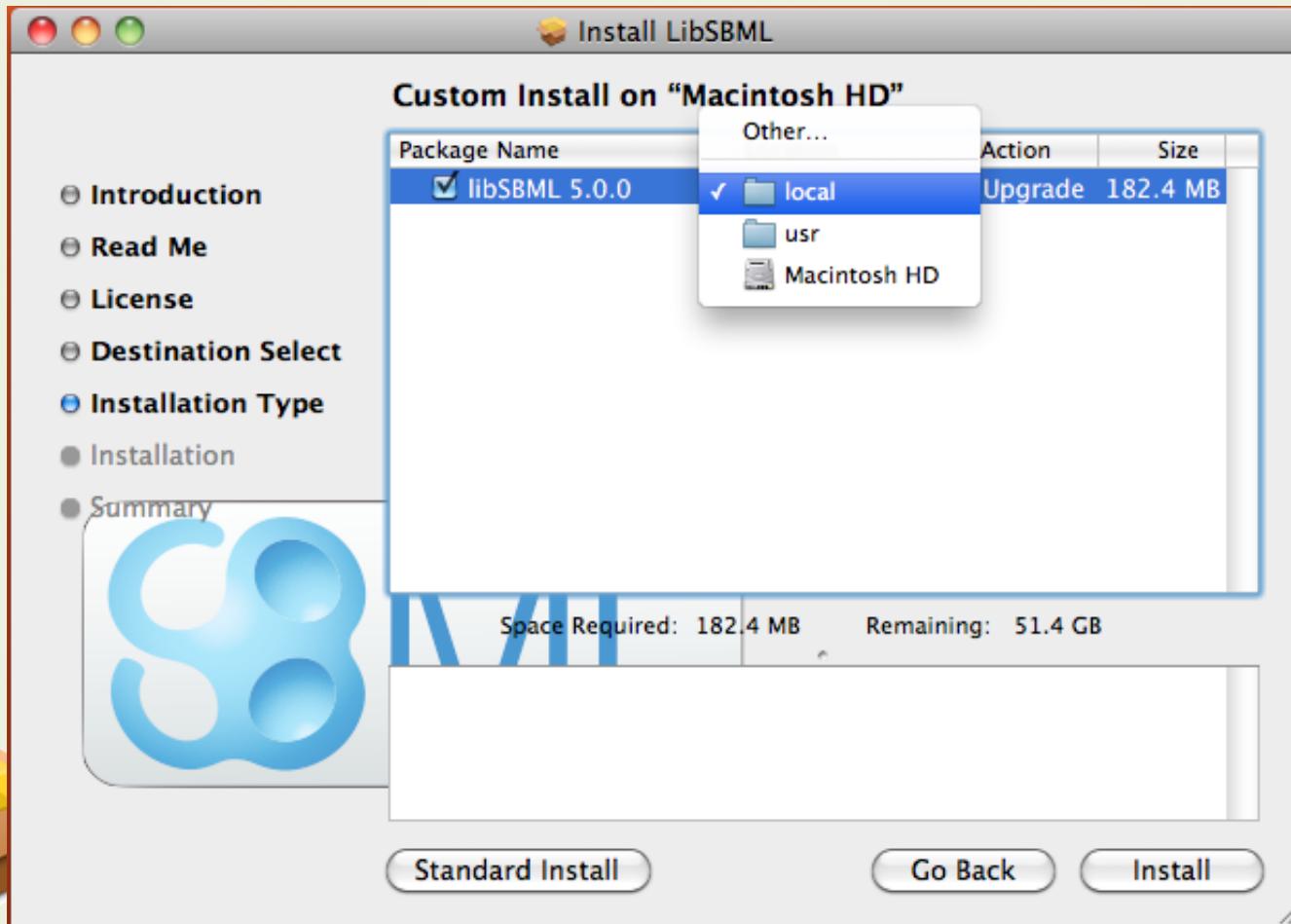


# OS X Installers – install location



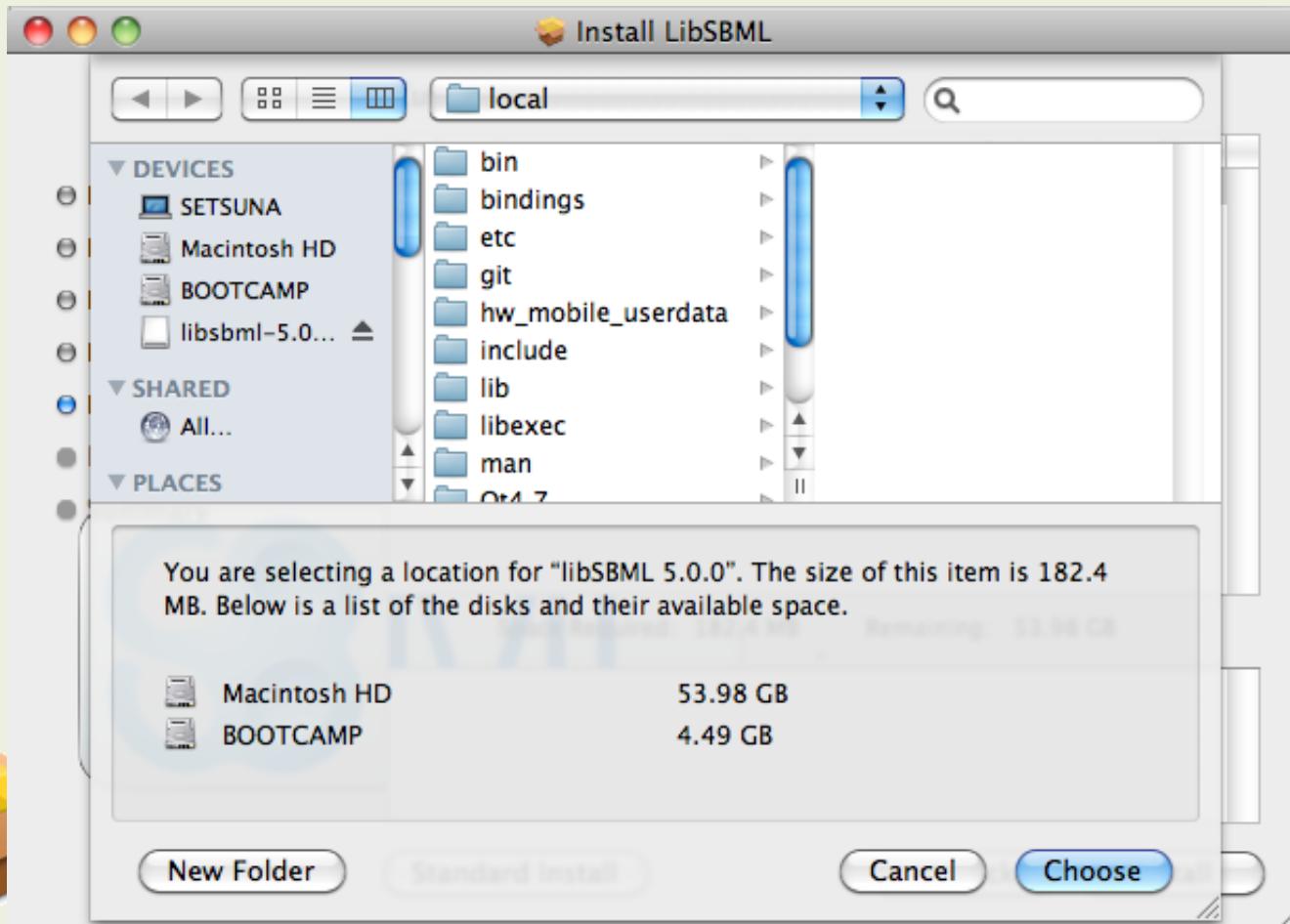
libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers



libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers



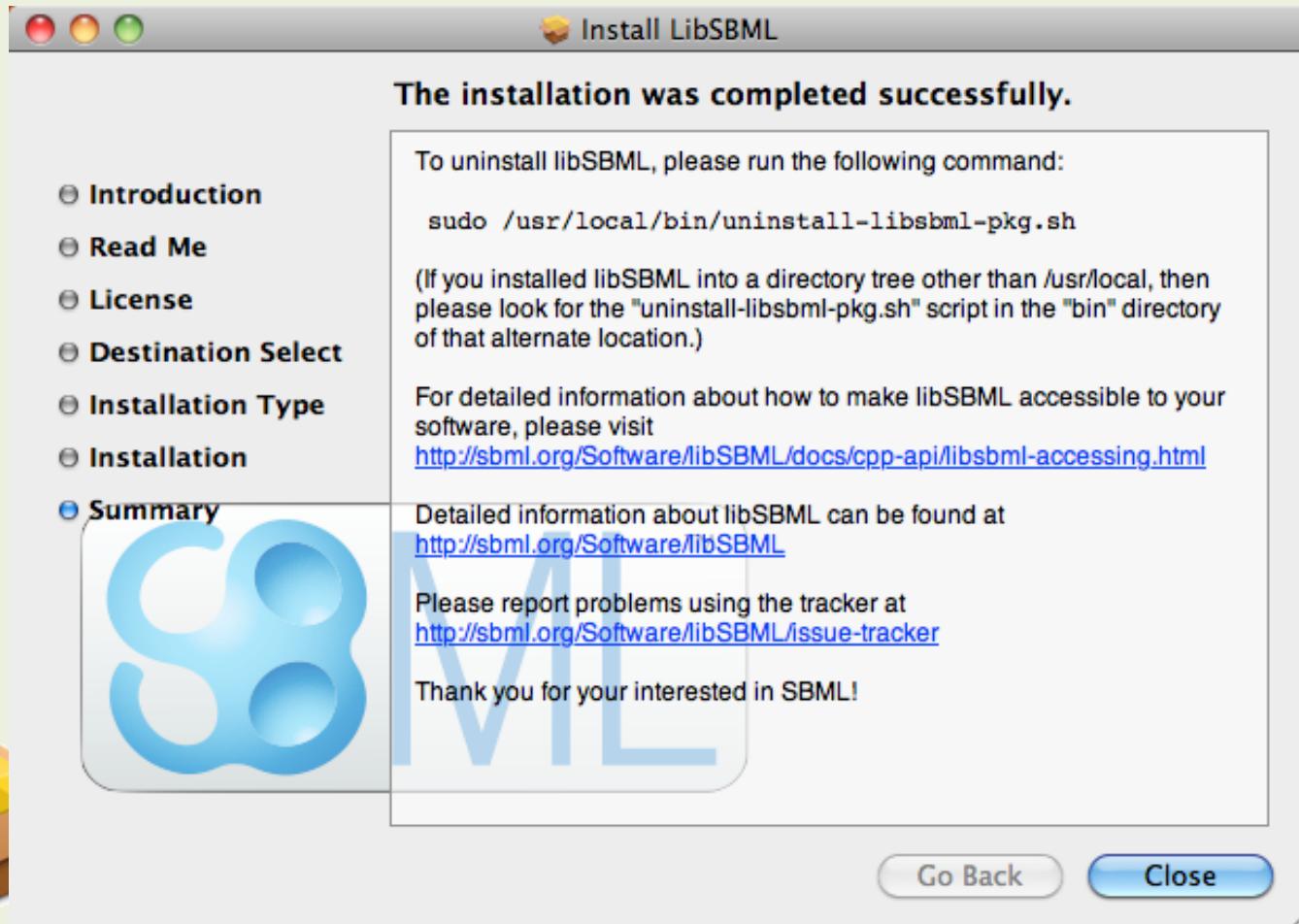
libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers



libSBML-5.0.0-libxml2-  
snowleopard.pkg

# OS X Installers



# 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`



[libSBML-5.0.0-libxml2-snowleopard.pkg](#)

# 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

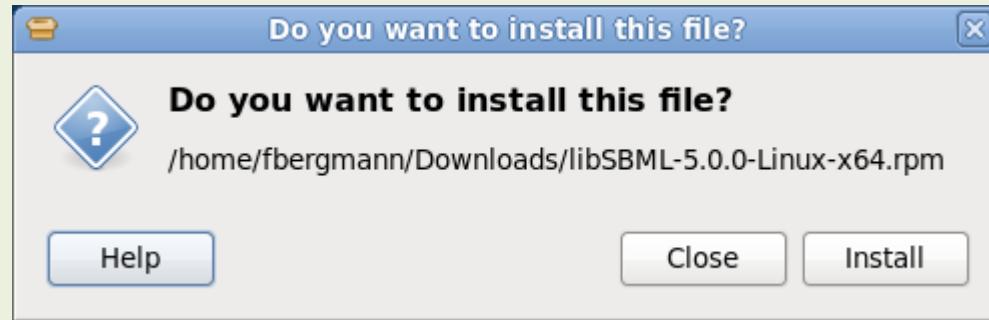
/usr/local/lib/mono/libsbmlcsP/libsbml.dylib

# 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



# Linux packages



# 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  $\geq 2.7.3$
  - Expat  $\geq 1.95.8$
  - Xerces-c  $\geq 2.7.0$
- Compression library:
  - Zlib  $\geq 1.2.3$  (optional)
  - Bzip2  $\geq 1.0.5$  (optional)
- Language bindings:
  - Swig / Swigwin  $\geq 2.0.0$  (optional)
- Documentation
  - Doxygen  $\geq 1.6.3$  (optional)
- CMake  $\geq 2.8.4$  (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
```

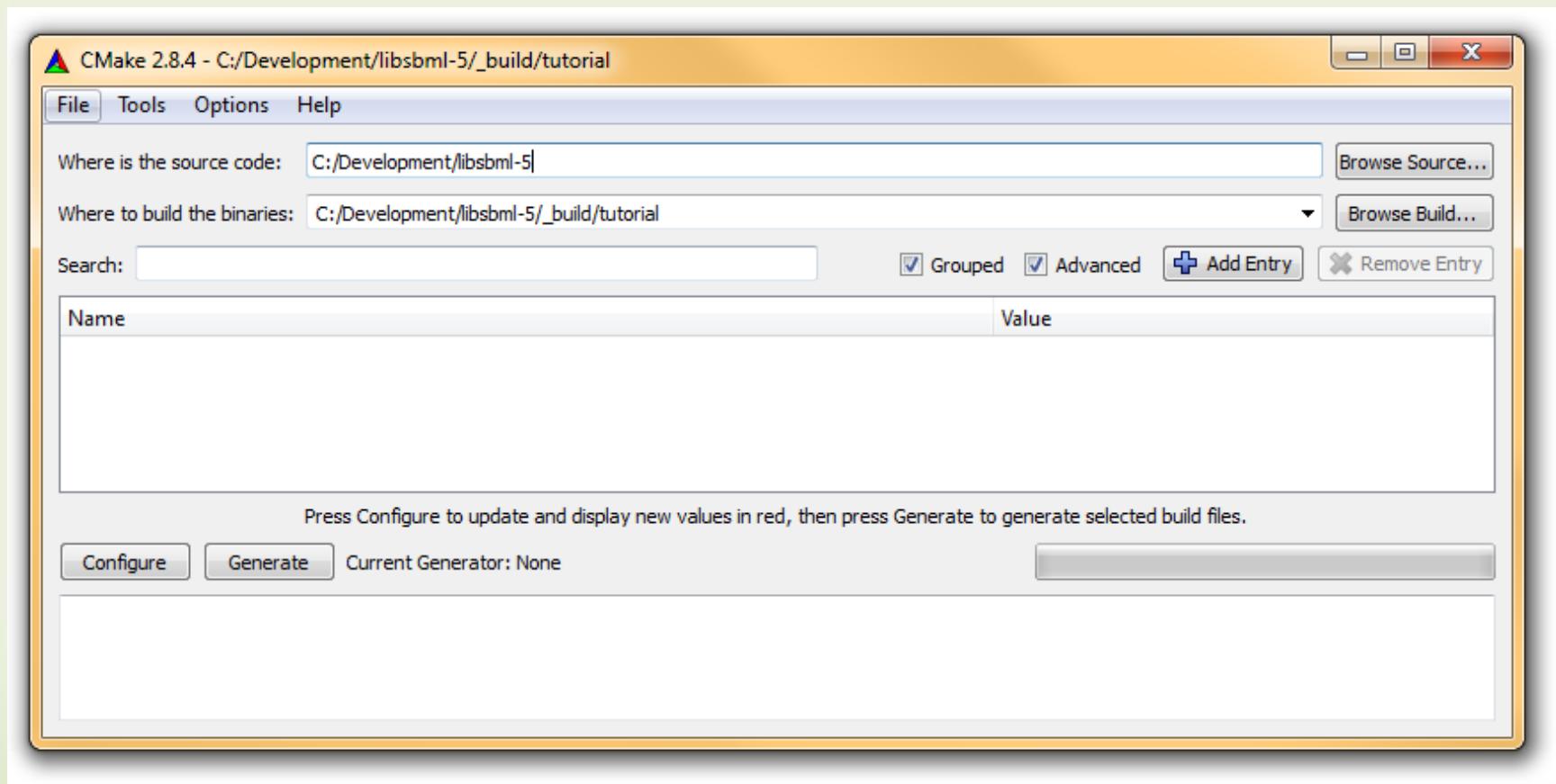
# GNUmake options

- 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]

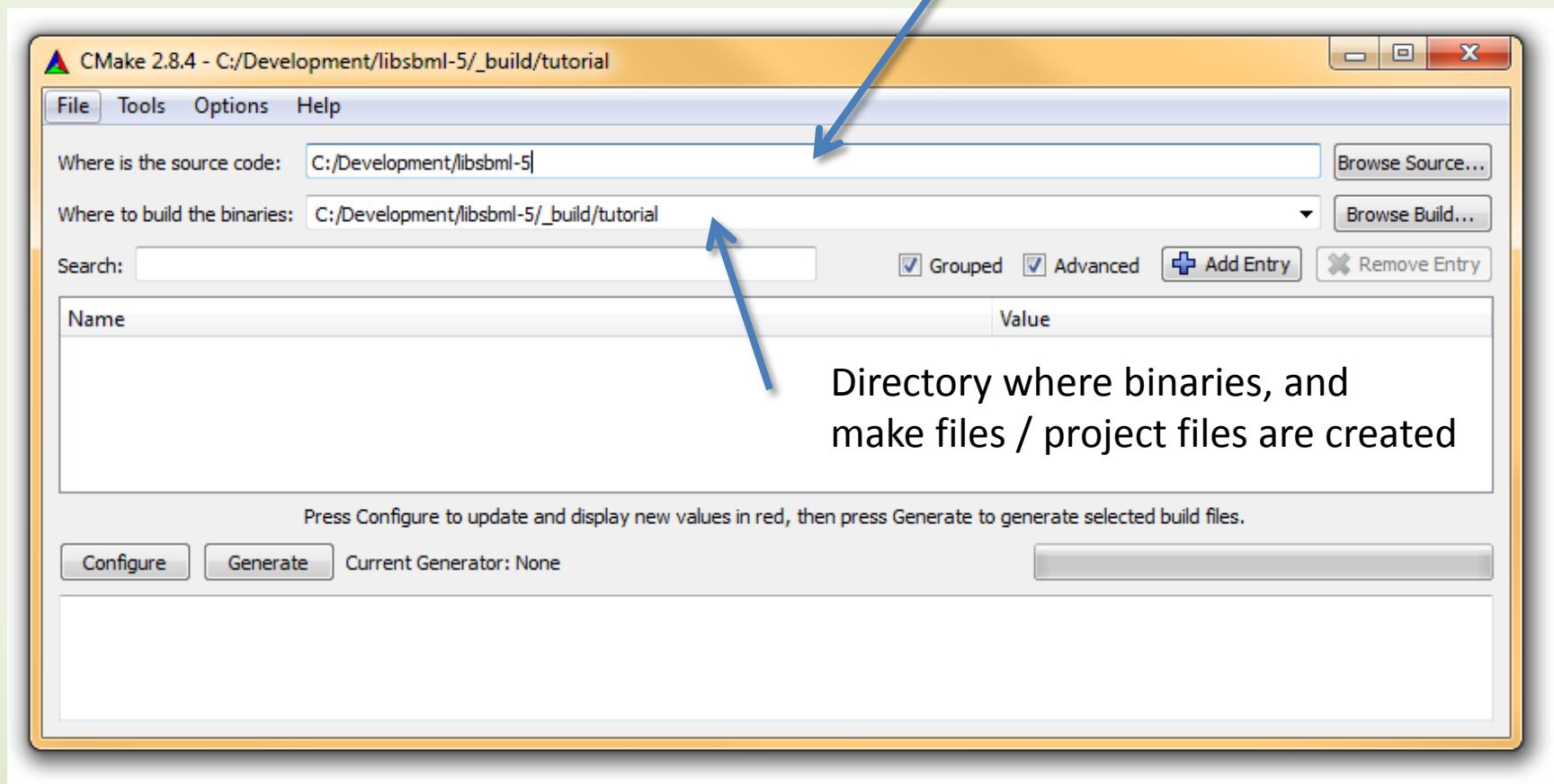
# CMake

- 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

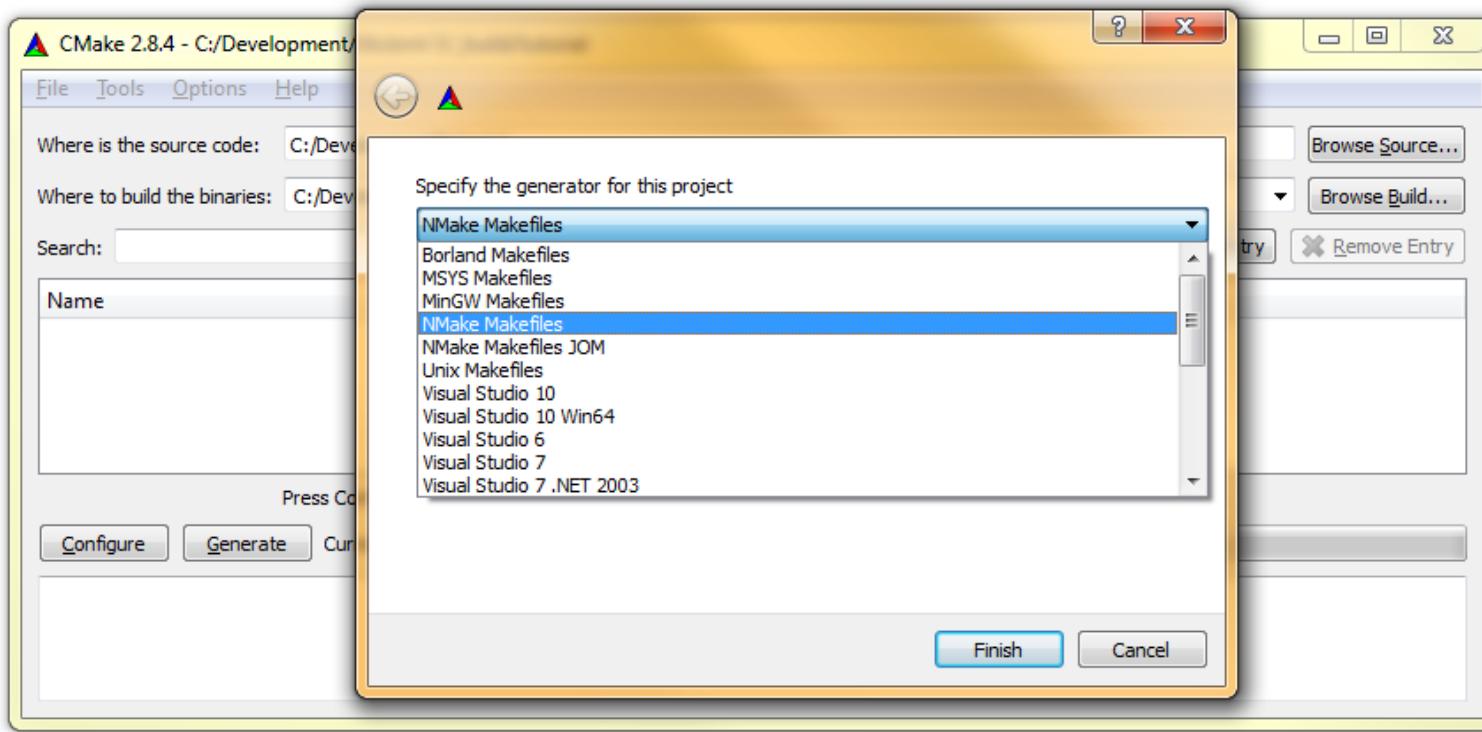
# CMake configuration



# CMake configuration

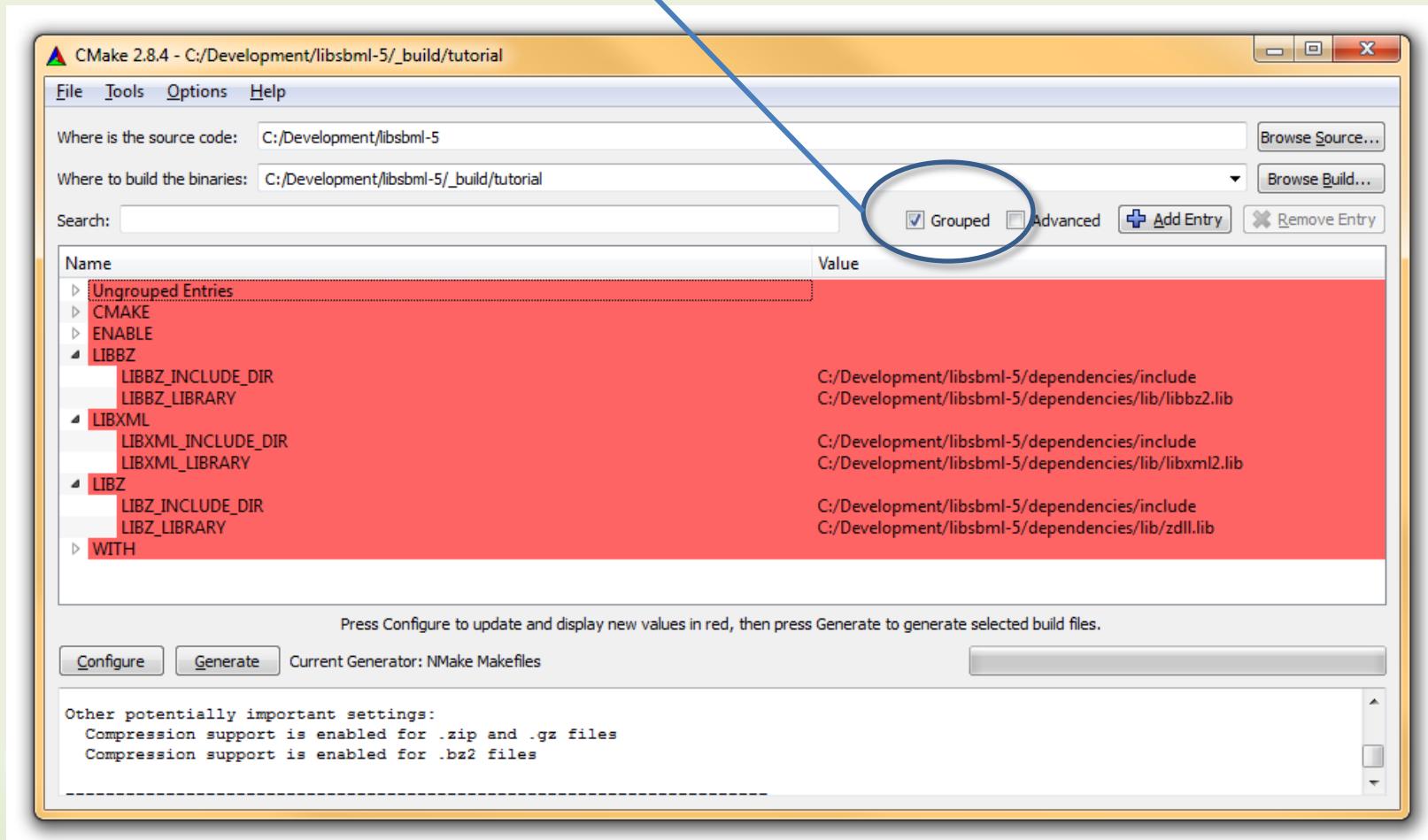


# CMake configuration

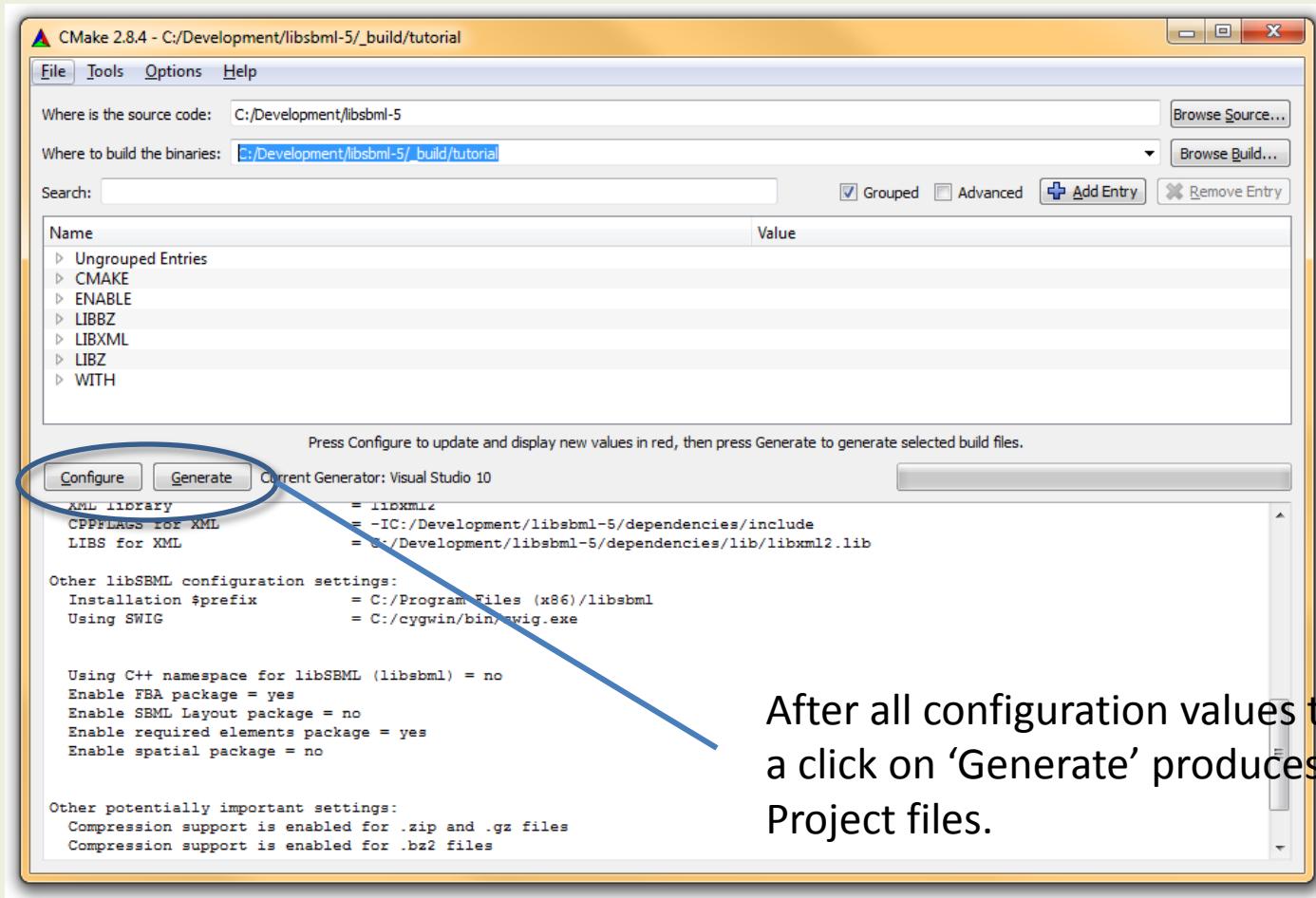


# CMake configuration

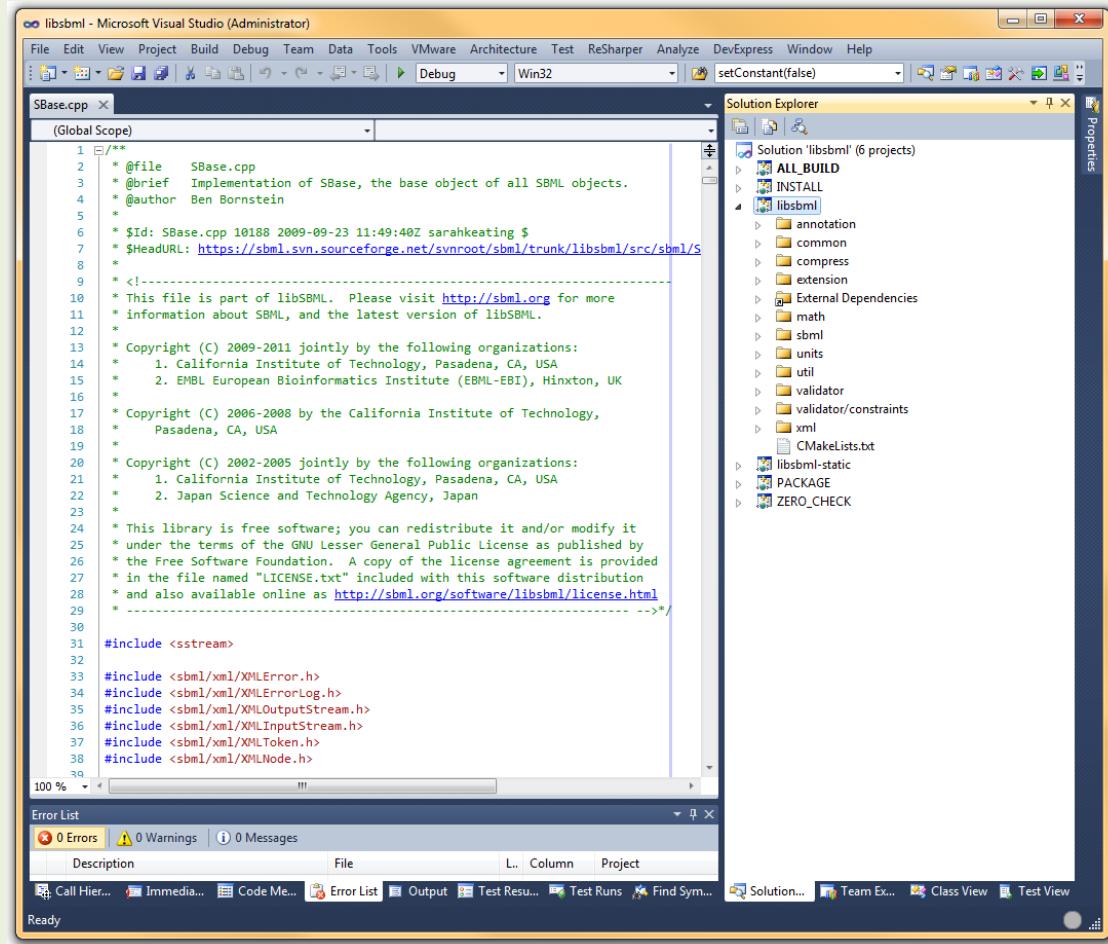
Grouping makes it easy to navigate the options



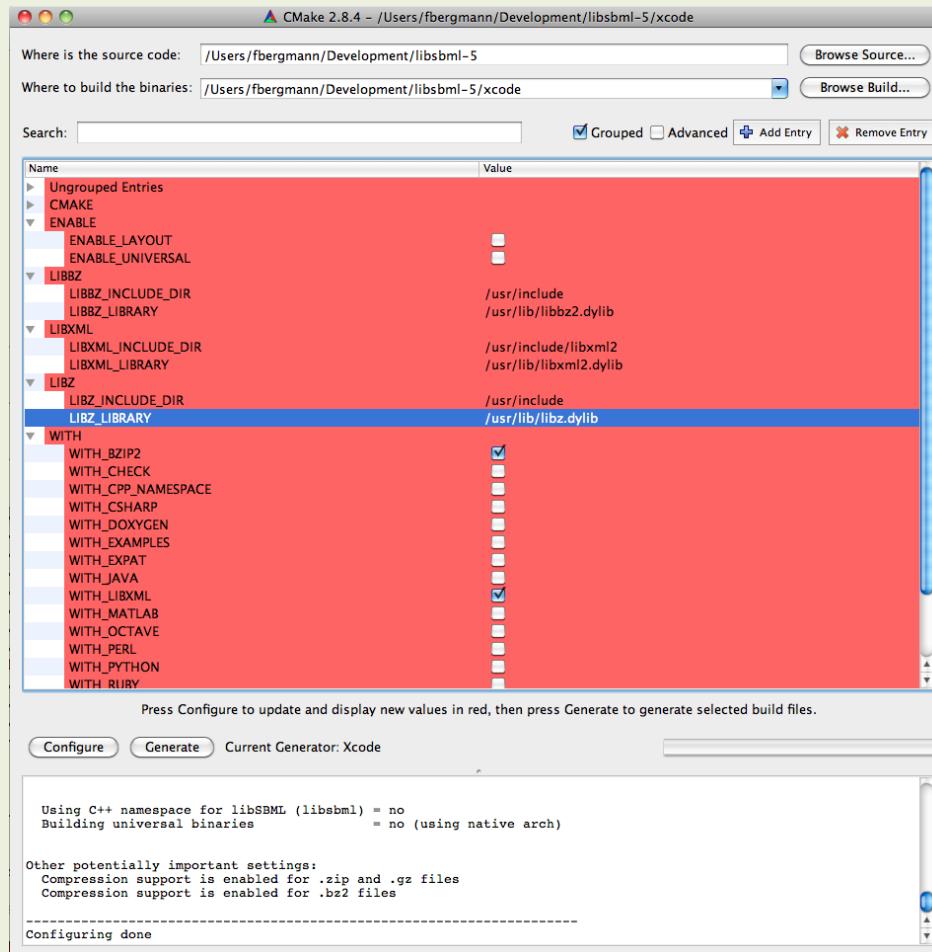
# CMake configuration



# Visual Studio



# CMake configuration on OS X



# CMake configuration on OS X

The screenshot shows the Qt Creator IDE interface. The top bar displays the project name "RelWithDebInfo | ALL\_BUILD | example\_c\_c..." and various tool icons. The main window is divided into several panes:

- Groups & Files:** On the left, it shows the project structure under "libsbml". The "Sources" folder is expanded, listing numerous files like SBase.cpp, SBMLTypeCodes.h, etc., along with their file sizes (e.g., 347K, 435K, 396K, 616K, 799K, 352K). Other collapsed categories include "ALL\_BUILD", "sbml", "sbml-static", and various "example\_c\_..." subfolders.
- File Name:** A table view showing the list of files from the Sources folder.
- Code Editor:** The central pane displays the content of SBase.cpp. The code includes copyright notices, SVN metadata, and a detailed description of the SBase class implementation.
- Search:** A search bar at the top right allows for string matching across the project.

```
/** @file SBase.cpp
 * @brief Implementation of SBase, the base object of all SBML objects.
 * @author Ben Bornstein
 *
 * $Id: SBase.cpp 10188 2009-09-23 11:49:40Z sarahkeating $
 * $HeadURL: https://sbml.svn.sourceforge.net/svnroot/sbml/trunk/libsbml/src/sbml/SBase.cpp $
 *
 * <!--
 * This file is part of libSBML. Please visit http://sbml.org for more
 * information about SBML, and the latest version of libSBML.
 *
 * Copyright (C) 2009-2011 jointly by the following organizations:
 *   1. California Institute of Technology, Pasadena, CA, USA
```

At the bottom, a status bar indicates "Compiling 32 of 151 source files..." and "sbml (2 of 31) 36".

# 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



Akiya Jouraku  
Keio, Japan



Ben Bornstein  
JPL, USA



Mike Hucka  
Caltech, USA