Installing CompuCell3D from source

3.4.1

Maciej Swat Biocomplexity Institute, Indiana University

Installing CompuCell3D from source Maciej Swat

Why you might want to install from source?

- 1. There are no binaries for your platform (e.g. gentoo linux)
- 2. You want to develop new modules
- 3. You want to have latest version of CompuCell3D (we do not post new binaries as often as we do with source code)
- 4. You want to run CompuCell3D on a cluster where programs are installed in nonstandard locations
- 5. The install script does not work properly (this is especially true if the dependencies are installed in non-standard locations. We will work in the future to improve installation script so that it will be more robust)

Prerequisites:

- •C++ Compiler (g++ or Visual Studio compilers)
- •CMake 2.6 or higher (<u>www.cmake.org</u>)
- •VTK 5.x or higher (<u>www.vtk.org</u>)
- •Qt4 (<u>www.qtsoftware.com</u>)
- •PyQt4 (<u>http://www.riverbankcomputing.co.uk/news</u>)
- •Python Development files 2.4 or higher ,but NOT 3.x series (www.python.org)
- •SWIG 1.3 or higher (<u>www.swig.org</u>)

Unpack or check out CompuCell3D package (in my case I will store source code in this directory D:\Project_SVN_CC3D\branch\3.4.1). Open cmake-gui (it will work on all the platforms). Here I am showing you how to configure CompuCell3D for compilation on Windows

<u>)</u> CMake 2.6-patch 2						
File Tools Options Help						
Where is the source code:						Browse Source
Where to build the binaries:					•	Browse Build
Search:			Simple View	•	🕂 Add Entry	💥 Remove Entry
Name		Value				
Pre	ss Configure to update and display new values in re	d, then pr	ess Generate to	generate selec	ted build files.	
Configure Generate	Current Generator: None					

Point to locations where the source code is and where you want to store project files (makefiles, objectfiles, metafiles etc. this is internal directory used by CMake and your edvelopment environment – XCode, KDevelop ,Eclipse, or Visual Studio)

A CMake 2.6-patch 2	<u>- </u>
Where is the source code: D:/Project_SVN_CC3D/branch/3.4.1	Browse Source
Where to build the binaries: D:/Projects_build/3.4.1	Browse <u>B</u> uild
Search: Simple View	Add Entry
Name Value	
, Press Configure to update and display new values in red, then press Generate to gen	erate selected build files.
Configure Generate Current Generator: None	

Press "Configure" to start configuring the project. A dialog will pop up asking about your build syste. This means you have to choose how you want to build CompuCell3D – using makefiles and command line tool, or using IDE such as Visual Studio, Kdevelop, Eclipse or XCode



Here I have chosen to use Visual Studio 8 2005. Depending on your system you might have to make different selection. Now CMake will check your system to see if you have required tools.

🛕 CMake 2.6-patch 2	
File Tools Options Help	
Where is the source code: D:/Project_SVN_CC3D/branch/3.4.1 Where to build the binaries: D:/Projects_build/3.4.1	Browse Source Browse Build
Search:	Simple View 💌 🕂 Add Entry 🔀 Remove Entry
Name	Value
BUILD_PYINTERFACE BUILD_SHARED_LIBS CMAKE_BACKWARDS_COMPATIBILITY CMAKE_INSTALL_PREFIX EXECUTABLE_OUTPUT_PATH LIBPARY_OUTPUT_BATH	 ✓ 2.4 C:/Program Files/COMPUCELL3D
QT_QMAKE_EXECUTABLE SWIG_DIR SWIG_EXECUTABLE SWIG_VERSION	C:/qt-4.3.1/bin/qmake.exe C:/swig-1.31/Lib C:/swig-1.31/swig.exe 1.3.31
VTK_DIR VTK_LIBRARY_DIRECTORIES	C:/Program Files/VTK-5.2.1/lib/vtk-5.2 C:/Program Files/VTK-5.2.1/lib/vtk-5.2
Press Configure to update and display new values in re <u>Configure</u> <u>Generate</u> Current Generator: Visual Studio 8 2005 Installing: C:/Program Files/COMPUCELL3D/icons/cc3d_64 Installing: C:/Program Files/COMPUCELL3D/icons/cc3d_64	x64_logo_png
Configuring done	

Few important things:

As you can see all the dependencies were found without any problem on my system. To make sure this is the case do the following:

- •Add swig to your search path
- •Add Python to your search path
- •Create environment variable VTK_DIR=<VTK_installation_DIR>/lib/vtk-5.x. In my case I use the following value for this variable

VTK_DIR=c:\Program Files\VTK-5.2.1\lib\vtk-5.2

- •Add qmake (or qmake.exe) to your path
- •Create environment variable QMAKESPEC describing how you have built Qt4 library

In my case it is

QMAKESPEC=win32-msvc2005

But you may want to consult INSTALL or README manuals that ship with Qt4 source code

Next thing you should do is to change CompuCell3D installation directory to point to different than default location. As a matter of fact on OSX/Linux/Unix systems you might get warnings about not having write permissions for installtion directory. This is because by default on those systems CMake will try to install CompuCell3D into e.g. /usr/local and you need to be superuser to write there. To change installation directory pick different path for the CMAKE_INSTALL_PREFIX

🛕 CMake 2.6-patch 2	
File Tools Options Help	
Where is the source code: D:/Project_SVN_CC3D/branch/3.4.1	Browse Source
Where to build the binaries: D:/Projects_build/3.4.1	Browse Build
Search:	Simple View 💌 🕂 Add Entry 🔀 Remove Entry
Name	Value
BUILD_PYINTERFACE BUILD_SHARED_LIBS CMAKE_BACKWARDS_COMPATIBILITY	 ✓ ✓ 2.4
CMAKE_INSTALL_PREFIX EXECUTABLE_OUTPUT_PATH LIBRARY_OUTPUT_PATH	D:/Program Files/3.4.1
QT_QMAKE_EXECUTABLE SWIG_DIR SWIG_EXECUTABLE	C:/qt-4.3.1/bin/qmake.exe C:/swig-1.31/Lib C:/swig-1.31/swig.exe
SWIG_VERSION VTK_DIR VTK_LIBRARY_DIRECTORIES	1.3.31 C:/Program Files/VTK-5.2.1/lib/vtk-5.2 C:/Program Files/VTK-5.2.1/lib/vtk-5.2
Press Configure to update and display new values in	n red, then press Generate to generate selected build files.
Configure Generate Current Generator: Visual Studio 8 2005	
Installing: C:/Program Files/COMPUCELL3D/icons/cc3d_ Installing: C:/Program Files/COMPUCELL3D/icons/cc3d_ Installing: C:/Program Files/COMPUCELL3D/icons/cc3d_	64x64_logo.png 64x64_logo_setup.ico 64x64_logo_www.ico
Configuring done	

Press "Configure" again and...

🛕 CMake 2.6-patch 2	
File Tools Options Help	
Where is the source code: D:/Project_SVN_CC3D/branch/3.4.1	Browse Source
Where to build the binaries: D:/Projects_build/3.4.1	Browse Build
Search:	Simple View 💌 🚣 Add Entry 🗮 Remove Entry
Name	Value
BUILD_PYINTERFACE BUILD_SHARED_LIBS CMAKE_BACKWARDS_COMPATIBILITY CMAKE_INSTALL_PREFIX EXECUTABLE_OUTPUT_PATH LIBRARY_OUTPUT_PATH QT_QMAKE_EXECUTABLE SWIG_DIR SWIG_EXECUTABLE SWIG_VERSION VTK_DIR VTK_LIBRARY_DIRECTORIES	
Press Configure to update and display new values in re <u>Configure</u> <u>Generate</u> Current Generator: Visual Studio 8 2005 Installing: D:/Program Files/3.4.1/icons/cc3d_64x64_loc Installing: D:/Program Files/3.4.1/icons/cc3d_64x64_loc Installing: D:/Program Files/3.4.1/icons/cc3d_64x64_loc Configuring done	ed, then press Generate to generate selected build files.

Notice, the "Generate" button is activated, now all you have to do is to press it and it will generate Visual Studio project that we will use to compile CompuCell3D. If you look into CMake message panel you will notice the following warning:

🛕 CMake 2.6-patch 2				
File Tools Options Help				
Where is the source code: D:/Project_SVN_CC3D/branch/3.4.1				Browse <u>S</u> ource
Where to build the binaries: D:/Projects_build/3.4.1			•	Browse <u>B</u> uild
Search:		Simple View	🕂 <u>A</u> dd Entry	💥 <u>R</u> emove Entry
Name	Value			▲
BUILD_PYINTERFACE	V			
CMAKE_BACKWARDS_COMPATIBILITY	2.4			
CMAKE_INSTALL_PREFIX	D:/Program Files/3	3.4.1		•
Press Configure to update and display new values	in red, then press	Generate to generate selecte	ed build files.	
Configure Generate Current Generator: Visual Studio 8 2005				
Configure Generate Current Generator: Visual Studio 8 2005 Installing: D:/Program Files/3.4.1/icons/cc3d_64x64_logo_setup.ico Installing: D:/Program Files/3.4.1/icons/cc3d_64x64_logo_www.ico Configuring dome Cflake Warning (dev) at core/CompuCellPlayer/QVTRWidget/CflakeLists.txt:78 (ADD_LIBRARY): Policy CHP0003 should be set before this line. Add code such as if(COMHAND cmake_policy) cmake_policy(SET CHP0003 NRW) endif(COMHAND cmake_policy) as early as possible but after the most recent call to cmake minimu_required or cmake_policy(VERSION). This warning appears because target "QVTK" links to some libraries for which the linker must search: imm32, winmm, ws2_32, vtkRendering, vtkGraphics, vtkImaging, vtkGommon vtkIO, vtkDICOMParser, vtNetCDF, vtkmataio, comct132, vtksqlite, vtkpng vtkverdict, vtkFiltering, vtkCommon, vtksy, ws2_32, wsock32 and other libraries with known full path: C:/qt-4.3.1/lib/QtGuid4.lib Cflake is adding directories in the second list to the linker search path in case they are needed to find libraries from the first list (for backwards compatibility with Cflake 2.4). Set policy CHPO003 to DD or NEW to emable or disable this behavior explicitly. Run "cmakehelp-policy CHPO003" for brock information				
Generating done				_

It means that we need to set up Library policy but we have not done it. It is OK to ignore this warning in this case. Now our project is generated. **All the steps show here apply to all the platforms.** Now let's see how we compile CC3D in VS 2005.

Open Visual Studio



Open CompuCell3D project file. It will be file called ALL_BUILD.vcproj in D:\Projects_build\3.4.1



Go to Build->Configuration Manager... and change ActiveSolutionConfiguration to RelWithDebInfo or to Release



Now you are ready to compile CompuCell3D. Right-click on ALL_BUILD in Solution Explorer and choose "Build"



After you are done with compilation you have to install CompuCell3D to the installation directory (CMAKE_INSTALL_PREFIX). Simply right-click on INSTALL in Solution Explorer and choose "Build". After this step CompuCell3D is ready to use.

🏀 COMPUCELL3D - Microsoft Visual Studio				
File Edit View Project Build Debug Tools Window Community Help				
i 🛅 • 🛅 • 💕 🛃 🦪 🐰 ங 🛍 🕫 • 🕅 • 🖓	🔍 🕨 RelWithDebInfi 🔹 Win32 🔹 🎯 AST_replaceConstraints 🔹 🔩 🖄	🎌 🛃 🖂 👻 💂		
Solution Explorer - INSTALL 🚽 🗸 🗸	Start Page Output	- ×		
	Show output from: Build 🔹 🚽 📭 🚑 💽			
Solution Explorer - INSTALL Image: ContactShared Image: ContactShared Image: ContactShared Image: Contact Image: ContactShar	Start Page Output Show output from: Build Image: Start Page G5>PDESolversProxy.obj: warning LNK4217: locally defined symbol ?teerableName@File G5>PDESolversProxy.obj: warning LNK4217: locally defined symbol ?teerableName@Kei G5>PDESolversProxy.obj: warning LNK4217: locally defined symbol ?tee	A Solver FE@CompuCell3D@@QAE@> exibleDiffusionSolverFE@CompuCell3D@@QAE@ sionSolverADE@CompuCell3D@@QAE@ exibleDiffusionSolverADE@CompuCell3D@@QAE@ exibleDiffusionSolverADE@CompuCell3D@@QAE nsolver@CompuCell3D@@QAE@ ionSolverADE@CompuCell3D@@QAE@ ionSolver@CompuCell3D@@QAE@ ionSolver@CompuCell3D@@QAE@> actionDiffusionSolverFE_SavHog@CompuCell3D actionDiffusionSolverFE_SavHog@CompuCell3D@@QAE@> actionDiffusionSolverFE_SavHog@CompuCell3D@@QAE@> actionDiffusionSolverFE_SavHog@CompuCell3D ionSolverFE_SavHog@CompuCell3D ionSolverFE_SavHog@CompuCell3D ionSolverFE@CompuCell3D@@QAE@> actionDiffusionSolverFE@CompuCell3D@@QAE@> actionDiffusionSolverFE@CompuCell3D@@QAE@> actionDiffusionSolverFE@CompuCell3D@@QAE@> actionDiffusionSolverFE@CompuCell3D@@QAE@> sionSolverFE@CompuCell3D@@QAE@> sionSolverFE@CompuCell3D@@UAE> solver2DFE@CompuCell3D@@UAE>>> File Line		
Pacte				
Aste				
Remove Repare				
kename				
Unioad Project				
Find Results 1				
Ready //				

If you are using other IDE like Eclipse, KDevelop or XCode, the steps involved in compilation are fairly similar to those on Visual Studio.

If you are using command line tools (make or nmake) then after generating you Makefiles by CMake all you need to do is to type:

make

And when compilation is done do:

make install