CompuCell3D

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Building CompuCell3D on Linux

Building CompuCell3D from source on Unix/Linux systems is fairly straightforward once all of it's dependencies have been satisfied. The following commands should build and install CC3D on most Unix/Linux systems.

Prerequisites

Hardware

CompuCell3D may build and run with less capable hardware, but has been tested with the following:

- 512MB RAM
- Hardware 3D Graphics Acceleration (most modern graphics cards)

Build Tools and Dependencies for PyQt4

In addition to the common Unix/Linux build tools, interpreters and, libraries, building and running CompuCell3D requires:

- Qt (version 4.6 or higher recommended)
- PyQt (with OpenGL modules)
- SWIG (version 1.3 or higher recommended)
- VTK (with Python wrappers, version 5.4 or higher recommended)
- Qwt (and PyQwt, version 4.2 or higher recommended)
- QScintilla (version 1.7 or higher recommended)
- CMake (CMake-GUI is recommended)
- Python (version 2.6 or higher recommended)

Build Tools and Dependencies for PyQt5

In addition to the common Unix/Linux build tools, interpreters and, libraries, building and running CompuCell3D requires:

- Qt (version 5.6 or higher recommended)
- PyQt5 (with OpenGL modules)
- SWIG (version 1.3 or higher recommended)
- VTK (with Python wrappers, version 6.3 or higher recommended)
- pyqtgraph (version 0.10.0 or higher recommended)
- QScintilla (version 2.9 or higher recommended)
- CMake (CMake-GUI is recommended)
- Python (version 2.7)

When building CC3D 3.7.6 or higher we suggest you use PyQt5 dependencies (PyQt4 will also work but then you will have to change PYQT_VERSION in CMake to 4, because PYQT_VERSION=5 is a default in CMAKE)

On Debian distributions, for PyQt5-based CC3D builds the following command should install all the required dependencies:

```
sudo apt-get install g++ swig cmake-gui python-numpy python-pyqt5 python-pyqt5.qsci python-pyqt5.qtopengl python-pyqt5.qtsvg libvtk6-dev python-vtk6 python-dev libxml2-dev build-essential git
```

to get plots working you may need to install pyqtgraph

```
pip install pyqtgraph
```

For PyQt4 based-builds the following command should install all the required dependencies (to change PYQT_VERSION in CMake to 4 when using PyQt4):

```
sudo apt-get install libvtk5-qt4-dev g++ swig libqwt5-qt4-dev python-qt4 python-qscintilla2 cmake-gui python-qt4-gl python-vtk python-qwt5-qt4 python-dev libxml2-dev build-essential git
```

Source Code

Once the dependencies have been satisfied make directory where you want to store source code, in my case it is in **/home/m/CC3D_GIT**

```
mkdir /home/m/CC3D_GIT
cd /home/m/CC3D_GIT
```

Once the directory has been created, obtain the source code from our GIT repository using the following command:

```
git clone  https://github.com/CompuCell3D/CompuCell3D.git .
```

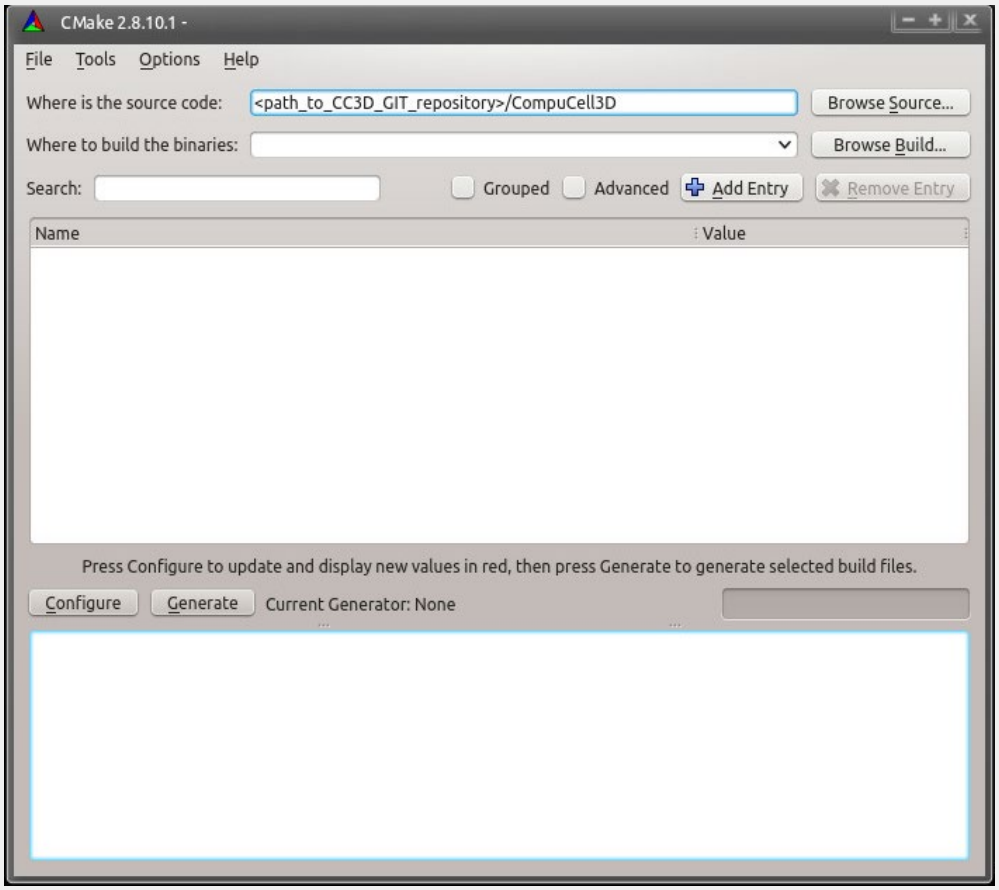
This will clone CC3D Git repository into current directory (remember about the **.** at the end of last command - it is important)

Build Configuration: Starting CMake

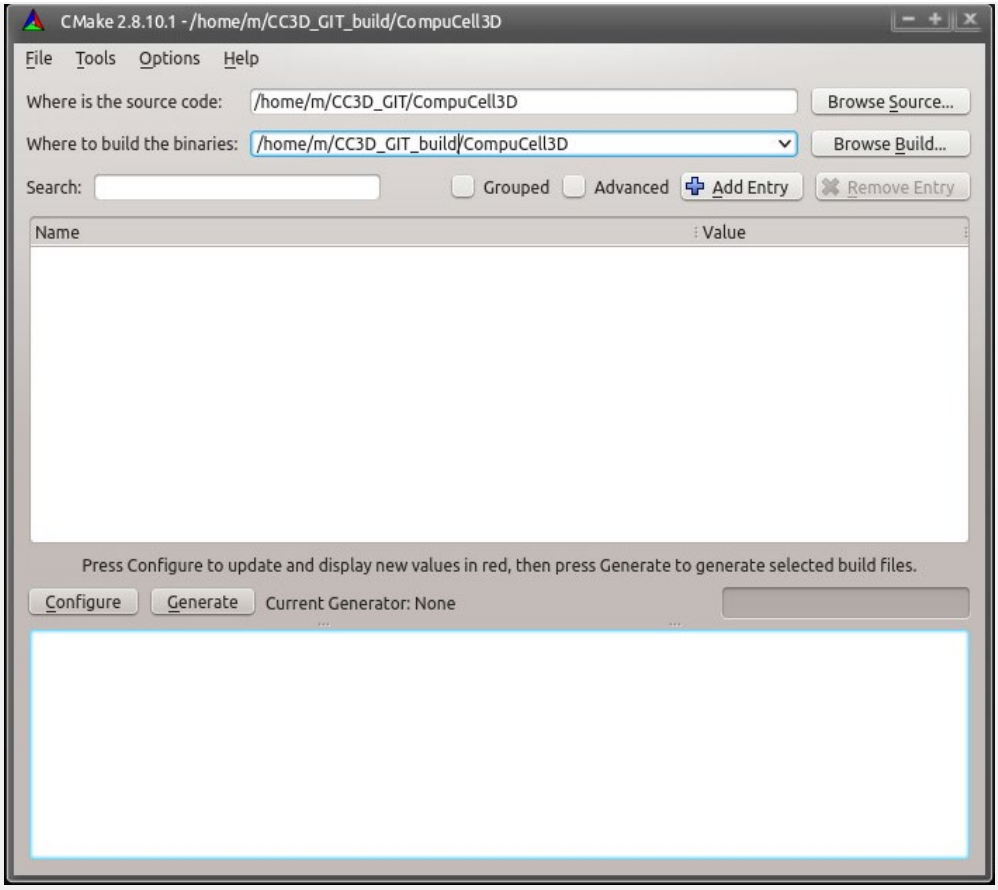
CompuCell3D is configured using the CMake build system. The following command starts the CMake GUI:

```
cmake-gui
```

That will start the build system, click `Browse Source...` and select the **CompuCell3D** source directory from the CompuCell3D GIT directory we have created above - in my case the CompuCell3D source directory is located in **/home/m/CC3D_GIT/CompuCell3D**:

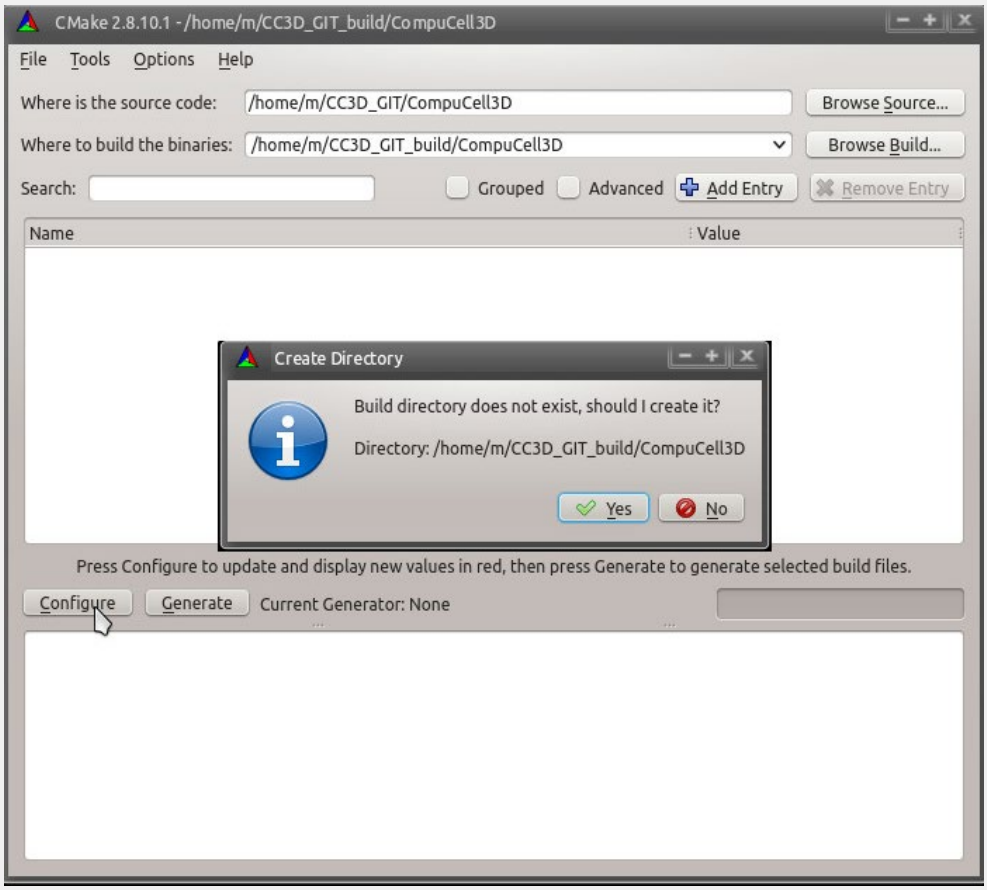


in addition to specifying source directory we also specify the location of the build directory i.e. a directory where compilation files will be stored. in my case it is **/home/m/CC3D_GIT_build/CompuCell3D**

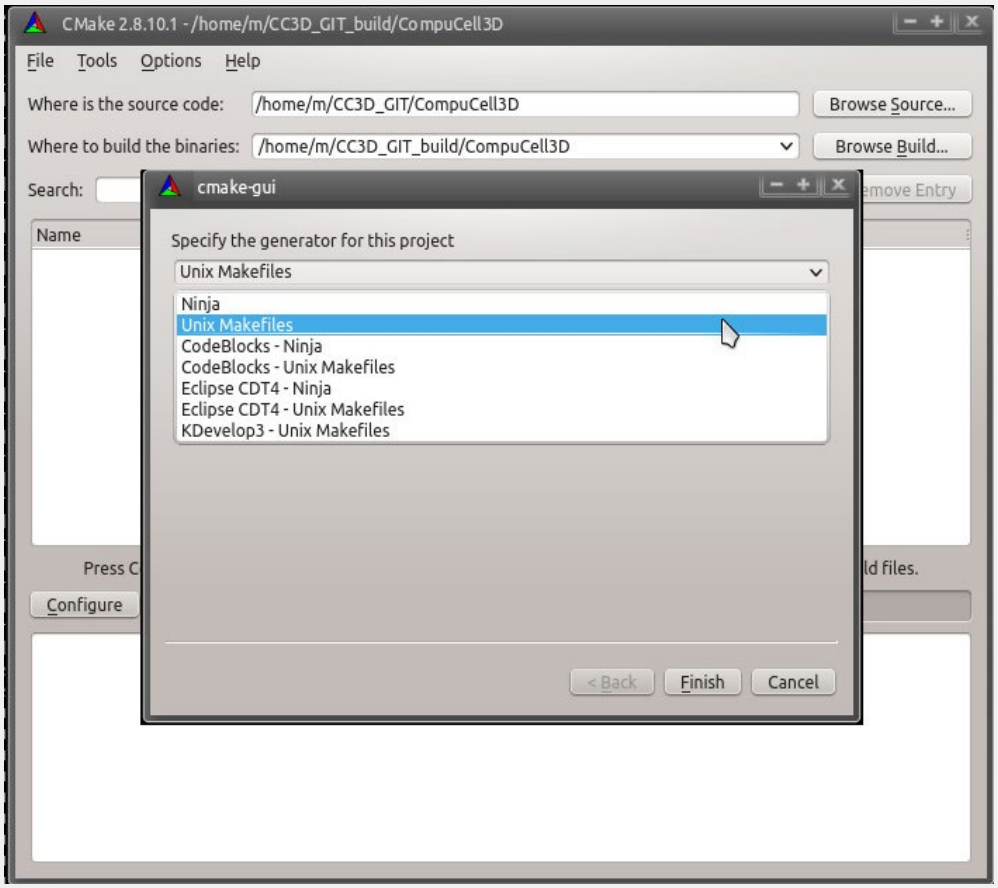


Build Configuration: Selecting Build System

We are ready to click `Configure`. A dialog box asking to create the build directory will appear:



and then one asking about the build system:



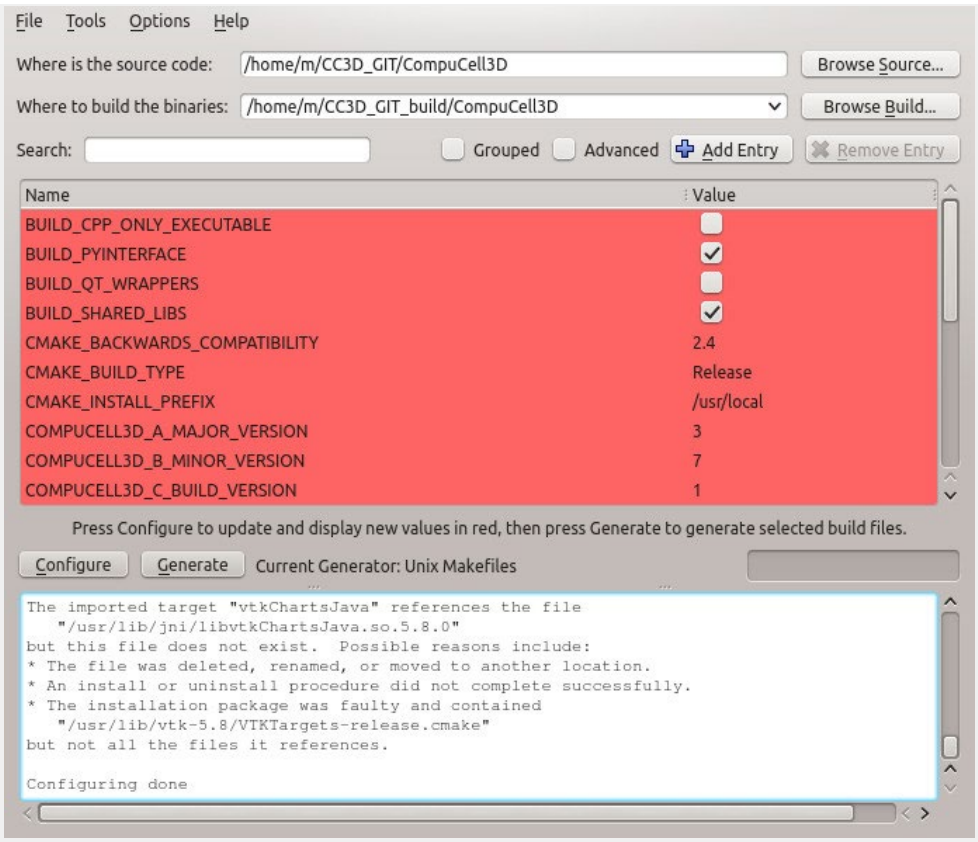
Select `Unix Makefiles` for the generator, select `Use default native compilers` and then click `Finish`. CMake will begin the configuration process. CMake will attempt to locate all of the dependencies installed above. If the following error occurs, ignore it:

```
CMake Error: Could not open file for write in copy operation /usr/local/pythonSetupScripts/Version.py.tmp
CMake Error: : System Error: No such file or directory
CMake Error at core/post_install_tasks/CMakeLists.txt:134 (configure_file):
  configure_file Problem configuring file
```

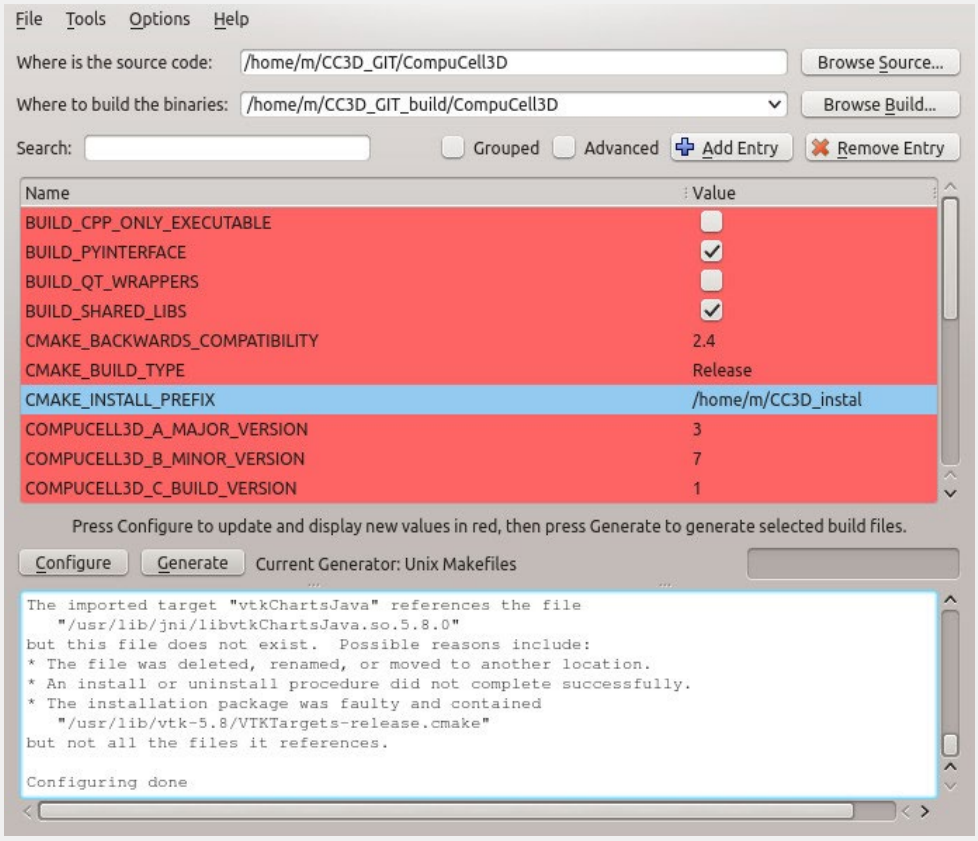
After the initial configuration has completed select `Grouped` and `Advanced` to make entering configuration values easier.

Build Configuration: CMAKE

In `CMAKE` confirm that CMake has located all the build tools. In the `CMAKE_BUILD_TYPE` field you may enter `Debug`, `RelWithDebInfo` or `Release` to specify the type of the binary you want to have - if you are developing extra modules compiling in the `Debug` or `RelWithDebInfo` can be helpful. By default Compucell3D build type is set to `Release`:

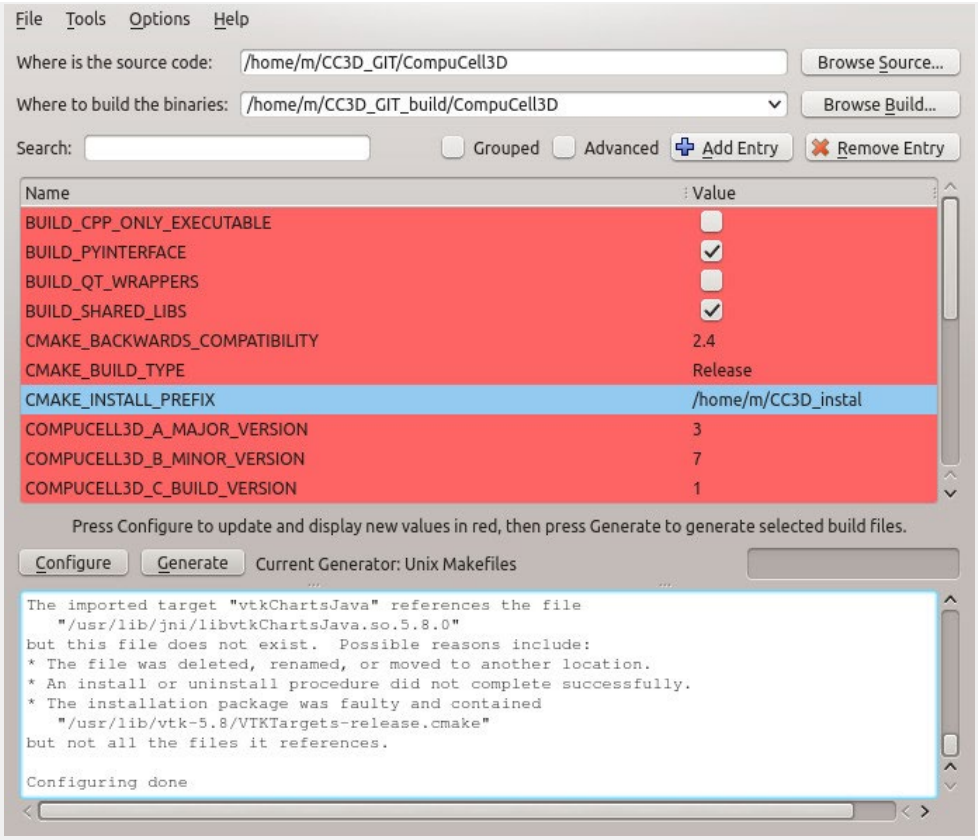


In the `CMAKE_INSTALL_PREFIX` field enter the directory you would like to install CompuCell3D into - this is important. We recommend that unless necessary you shold install CC3D into local directory - in my case it is **/home/m/CC3D_install**, .



Click on `Configure` to have all the values updated.

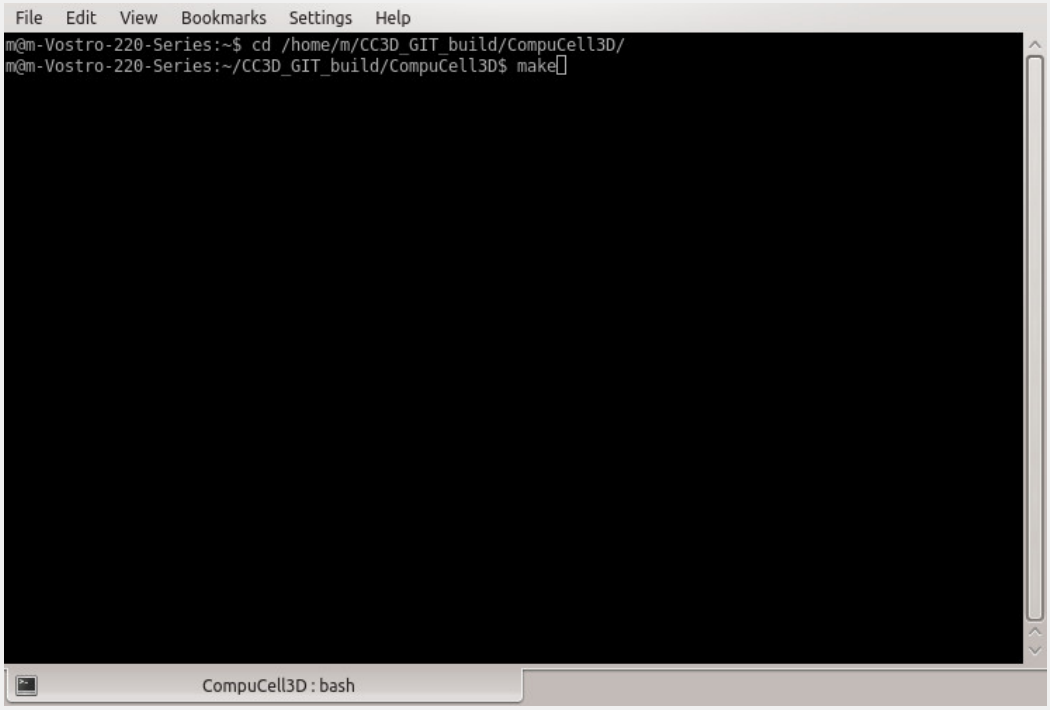
Click on `Configure` and then click on `Generate` to generate the Makefiles, ignore any warnings. Exit CMake



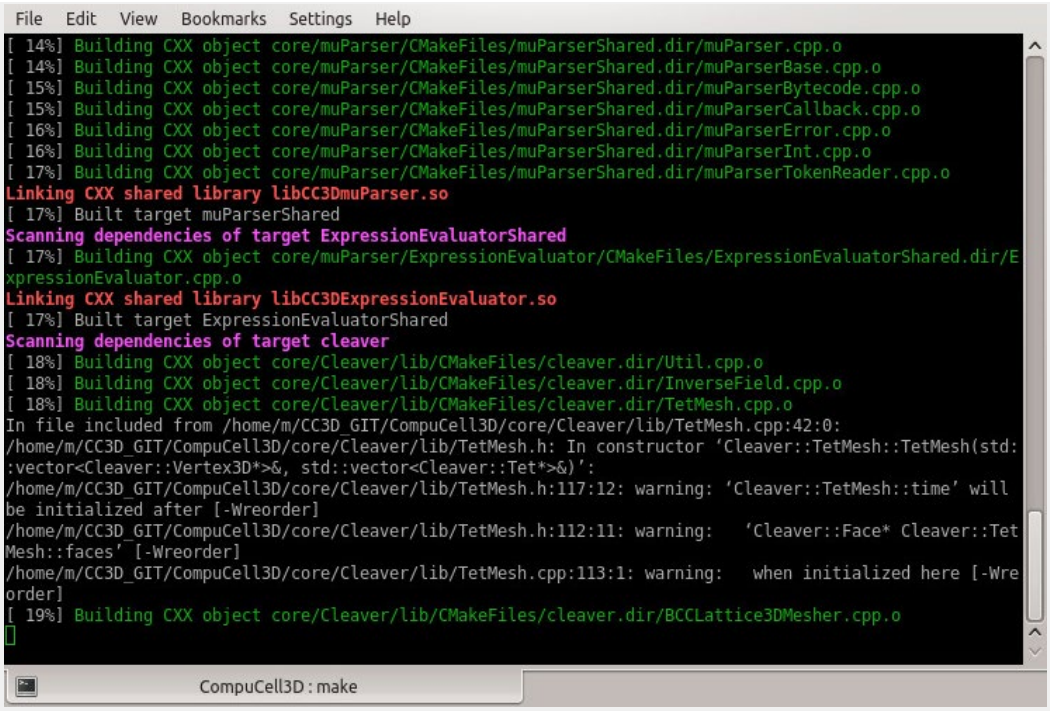
Building

To begin compiling CompuCell3D enter the build directory specified in the `Where to build the binaries` field of CMake earlier and use the following command: In my case I type:

```
cd /home/m/CC3D_GIT_build/CompuCell3D
make
```



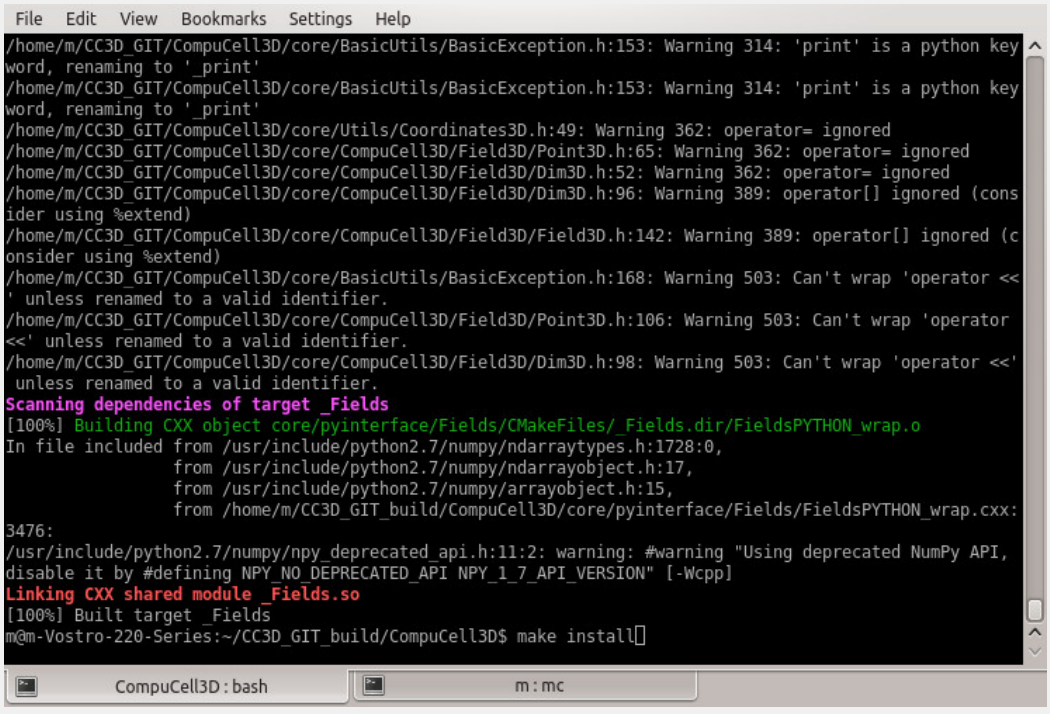
After the build begins you may see screen like this one:



Installing

Once compiling has completed CompuCell3D can be installed into the directory specified in the `CMAKE_INSTALL_PREFIX` field earlier by issuing the following command:

```
make install
```



Running

After CompuCell3D has finished installing you can start CompuCell3D by entering the installation directory (in my case it is in **/home/m/CC3D_install**):

```
cd /home/m/CC3D_install
```

and issuing the following command:

```
./compucell3d.sh
```