

# Building G4

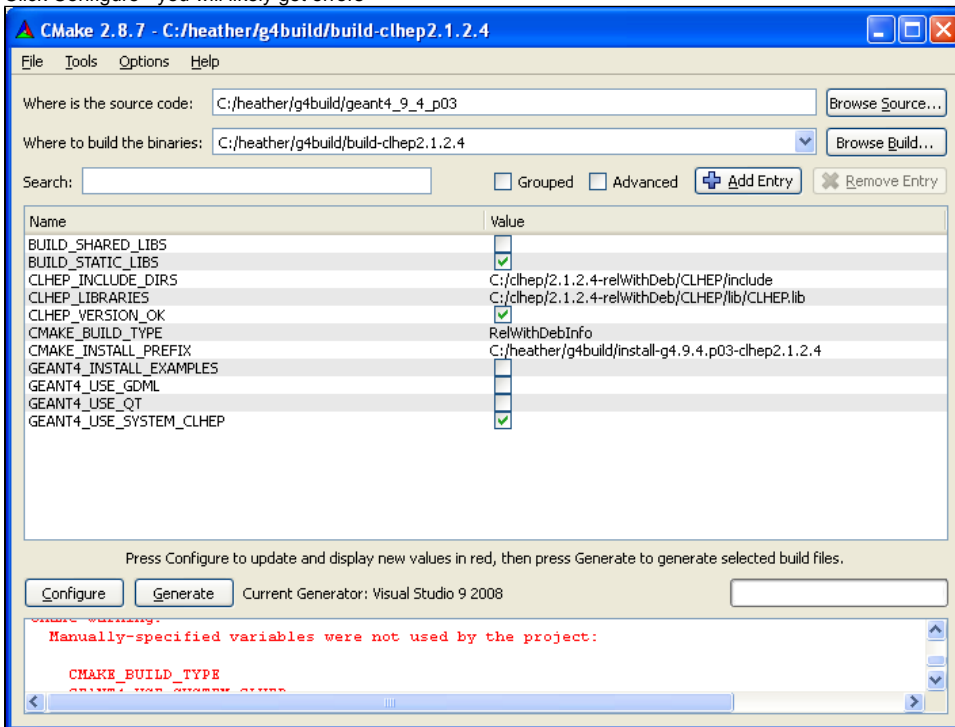
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## 9.4.p03

G4 now builds with CMake

### Windows Visual Studio 2008 (9)

1. Download the source from the G4 website
2. unzip and untar the source using GNU's gzip and tar for windows
3. Start up a DOS command window
4. Run C:\Program Files\Microsoft Visual Studio 9\Common\Tools\vsvars32.bat
5. Start up cmake-gui
6. Point "Where is the source code" at the G4 source
7. Create a separate build directory and point "Where to build binaries" at that location
8. Click Configure - you will likely get errors



9. Location of CLHEP needs to be set up
  - a. Click "Add Entry" CLHEP\_INCLUDE\_DIR, type "PATH", and point to the location of the include files.
  - b. It is not clear if CLHEP\_INCLUDE\_DIRS is the new term, so I also define this as well.
  - c. Click "Add Entry" CLHEP\_LIBRARIES, type FilePATH and point to the actual CLHEP.lib file
  - d. Do the same for CLHEP\_LIBRARY as it is also not clear if this is needed as well.
  - e. Click "Add Entry" and define CLHEP\_ROOT\_DIR as PATH
  - f. Click "Add Entry" and define CLHEP\_VERSION\_OK as a BOOL and check it (this seems to be a bug, it seems we shouldn't have to do this)
  - g. Click "Add Entry" and define GEANT4\_USE\_SYSTEM\_CLHEP as BOOL and check
  - h. Click "Add Entry" and define CMAKE\_INSTALL\_PREFIX as PATH and point it to the location you desire for the G4 installed binaries.
  - i. There doesn't seem to be a way to set G4VERBOSE or not via CMake
10. Click Configure again
  - a. actually looks like CLHEP\_INCLUDE\_DIR, CLHEP\_LIBRARY, CLHEP\_ROOT\_DIR, and GEANT4\_USE\_SYSTEM\_CLHEP are not needed
11. Click Generate
12. Open the solution file in Visual Studio
13. Update all the static library projects to use /MDd for the multi-threaded debug library (there doesn't seem to be a way to set that via CMake in this version of G4)  
<http://hypernews.slac.stanford.edu:5090/HyperNews/geant4/get/installconfig/1436/1.html>

14. Choose ALL\_BUILD and build
15. Choose Install and build

## 9.4.p01

The bug in 8.0.p01's G4ParticleDefinition.cc is fixed in 9.4, so no modification to the source is required.

## Windows 2008

### Building Geant4.8.0.p01 Using the Native Compilation Script

Unpack the G4 source, and you will find the Configure script in the top-level directory.

You could set the environment variable G4\_NO\_VERBOSE in the hopes of improving performance, though to date those improvements have not fully materialized, in fact as of G4 version 8.0.p01, a code modification (see updated G4ParticleDefinition.cc which is attached) is required to prevent the setting of G4\_NO\_VERBOSE from skipping important code in G4. Tracy has patched this and it is included in our 8.0.p01-gl4 version of G4, located in \$GLAST\_EXT/srcExtLibs/geant4.8.0.01-gl4-src.tar.gz

Make sure to install the header files into a single common directory.

Logs of the build are stored in the .config directory

Some interesting things... the library libG4parameterisations is the product of Tracy's CMT requirements used to build G4 rather than the native G4 build scripts. G4 calls this same library libG4parmodels

libG4visualizations is the product of Riccardo's addition to the CMT requirements file: <http://www.fisica.uniud.it/~glast/MRStudio/Geant4vis.html>

libG4g3tog4 is natively called libG4G3toG4

## 8.0.p01-gl4

We must use CLHEP 1.9.2.2 to build this version of Geant4 - there are incompatible changes in later versions of CLHEP (even 1.9.4.2).

### redhat4-i686-32bit-gcc34

1. Obtain the source from /afs/slac/g/glast/ground/GLAST\_EXT/srcExtLibs/geant4-8.0.p01-gl4-src.tar.gz and unpack a geant4.8.0.p01 directory will be created.
2. Enter the geant4.8.0.p01 directory and locate the Configure script
3. setenv G4\_NO\_VERBOSE 1
4. Create a directory named "data"
5. Run ./Configure -build
  - a. OS: Linux Compiler: g++
  - b. Expect to run these binaries on multiple machines: y
  - c. You'll answer where the source is located
  - d. Take default for where to install the libraries
  - e. Copy all headers into one directory
  - f. Store data in data directory
  - g. Accept default directories
  - h. Provide the location of CLHEP  
Base Directory: \$GLAST\_EXT/CLHEP/1.9.2.2/gcc34
  - i. Build shared libraries
  - j. Build static libraries too
  - k. Build global libraries
  - l. Do not build granular libraries
  - m. Do not build in DEBUG
  - n. G4UI\_NONE accept default n
  - o. G4UI\_BUILD\_XAW\_SESSION accept default n
  - p. G4UI\_BUILD\_XM\_SESSION accept default n
  - q. G4VIS\_NONE accept default n
  - r. G4VIS\_BUILD\_OPENGLX\_DRIVER accept default n
  - s. G4VIS\_BUILD\_OPENGLXM\_DRIVER accept default n
  - t. G4VIS\_BUILD\_DAWN\_DRIVER accept default n
  - u. G4VIS\_BUILD\_OIX\_DRIVER accept default n
  - v. G4VIS\_BUILD\_RAYTRACERXX\_DRIVER Set to Yes
  - w. G4VIS\_BUILD\_VRML\_DRIVER Set to Yes
  - x. G4LIB\_BUILD\_G3TOG4 Set to Yes
  - y. G4LIB\_BUILD\_ZLIB Set to Yes
  - z. G4ANALYSIS\_USE Accept default n
6. Run ./Configure -install
7. In the lib/Linux-g++ directory:
  - a. rename libG3toG4.\* to libG4g3tog4.\*
  - b. rename libparmodels.\* to libparameterisations.\*
8. Copy the following directories to the \$GLAST\_EXT/redhat4-i686-32bit-gcc34/geant4/8.0.p01-gl4/gcc34 directory  
include lib
9. Copy the tables directory from an existing Geant4 8.0.p01 installation in \$GLAST\_EXT, such as \$GLAST\_EXT/redhat4-i686-32bit-gcc34/gcc34/tables

## Windows VS2008

1. Install cygwin, if you do not already have it.  
Include gcc-g77 in the installation  
You may need to install an older version of "make"  
Rename the link.exe to link\_cyg.exe, so it will not be used. See: [http://geant4.web.cern.ch/geant4/support/windows\\_note.shtml](http://geant4.web.cern.ch/geant4/support/windows_note.shtml)
2. Obtain and build CLHEP 1.9.2.3 (the source for 1.9.2.2 no longer seems to be available)
3. Obtain the source from /afs/slac/g/glast/ground/GLAST\_EXT/srcExtlibs/geant4-8.0.p01-gl4-src.tar.gz and unpack a geant4.8.0.p01 directory will be created.
4. In a DOS command window, set up to use VS 2008:
  - a. set PATH=
  - b. set LIB=
  - c. set INCLUDE=
  - d. Run C:\Program Files\Microsoft Visual Studio 9.0\Common\Tools\vsvars32.bat
  - e. set LIB=C:\Program Files\Microsoft SDKs\Windows\v6.0A\Lib;%LIB%
  - f. set PATH=C:\WINNT\system32;C:\WINNT;C:\WINNT\System32\Wbem;C:\Program Files\Microsoft SDKs\Windows\v6.0A\bin;%PATH%
  - g. set INCLUDE=C:\Program Files\Microsoft SDKs\Windows\v6.0A\Include;include;%INCLUDE%
5. Start up a cygwin session:

```
cd cygwin/bin
bash --login -i
```
6. Enter the directory containing your G4 source code
7. Set the G4\_NO\_VERBOSE flag

```
export G4_NO_VERBOSE=1
```
8. set CLHEP\_LIB to CLHEP.lib (avoid trouble building shared libraries)

```
export CLHEP_LIB=CLHEP.lib
```
9. Create a data directory in the top-level of the G4 source
10. Run G4's Configure script

```
./Configure -build
```

  - a. OS: WIN-VC
  - b. Expect to run these binaries on multiple machines: y
  - c. You'll answer where the source is located
  - d. Take default for where to install the libraries
  - e. Copy all headers into one directory
  - f. Store data in data directory
  - g. Accept default directories
  - h. Provide the location of CLHEP  
Base Directory: \$GLAST\_EXT/CLHEP/1.9.2.3
  - i. and double-check the setting of CLHEP\_LIB
  - i. Do not Build shared libraries - lwe haven't been able to use them with GR for some time
  - j. Build static libraries
  - k. Do not build in DEBUG
  - l. G4UI\_NONE accept default n
  - m. G4UI\_BUILD\_XAW\_SESSION accept default n
  - n. G4UI\_BUILD\_XM\_SESSION accept default n
  - o. G4VIS\_NONE accept default n
  - p. G4VIS\_BUILD\_OPENGLX\_DRIVER accept default n
  - q. G4VIS\_BUILD\_OPENGLXM\_DRIVER accept default n
  - r. G4VIS\_BULID\_DAWN\_DRIVER accept default n
  - s. G4VIS\_BUILD\_OIX\_DRIVER accept default n
  - t. G4VIS\_BUILD\_RAYTRACERXX\_DRIVER Set to Yes
  - u. G4VIS\_BUILD\_VRML\_DRIVER Set to Yes
  - v. G4LIB\_BUILD\_G3TOG4 Set to Yes
  - w. G4LIB\_BUILD\_ZLIB Set to Yes
  - x. G4ANALYSIS\_USE Accept default n
11. After the build is complete, do ./Configure -install  
This should copy al the headers to the top level include directory
12. Rename all the \*.a static libraries to \*.lib