



Geant4 Installation

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Installation process

- 1) Check that you meet all the requirements**
- 2) Download Geant4 source code**
- 3) Configure the build using CMake**
- 4) Make & install**
- 5) Configure your environment to use Geant4**

① Supported platforms & requirements

- **Operating system**
 - “recent” Linux (e.g. CentOS 7), best support
 - macOS 10.10+
 - Windows 7+ (limited support, not recommended)
- **Compilers**
 - C++11 compliance
 - such as GCC 4.8.5+, clang 3.6+, Visual C++ 14.0 (2015)
- **CMake** (configuration generation tool) 3.3+
- **System libraries** (as development packages):
 - expat, xerces-c

Virtual Machine:
CentOS 7 with gcc 4.8.5

These may or may not be necessary. Just keep this in mind when compilation fails.

CMake installation (if not provided)

- Depending on the OS installation, CMake may not be installed by default. In that case you have to install it:
 - **Linux:** it is recommended to use the CMake provided by the package management system of your distribution.

If version 3.3+ is not available:

1. **download** the latest version (<http://www.cmake.org/>)
 2. **unzip** the tar-ball
 3. **./bootstrap, make, make install**
- **macOS:** install it using the Darwin64 **dmg installerpackage**
 - **Windows:** install it using the Win64/32 **exe installerpackage**

Note: You may also want to install **ccmake** and/or **cmake-gui** tools for user-friendly configuration

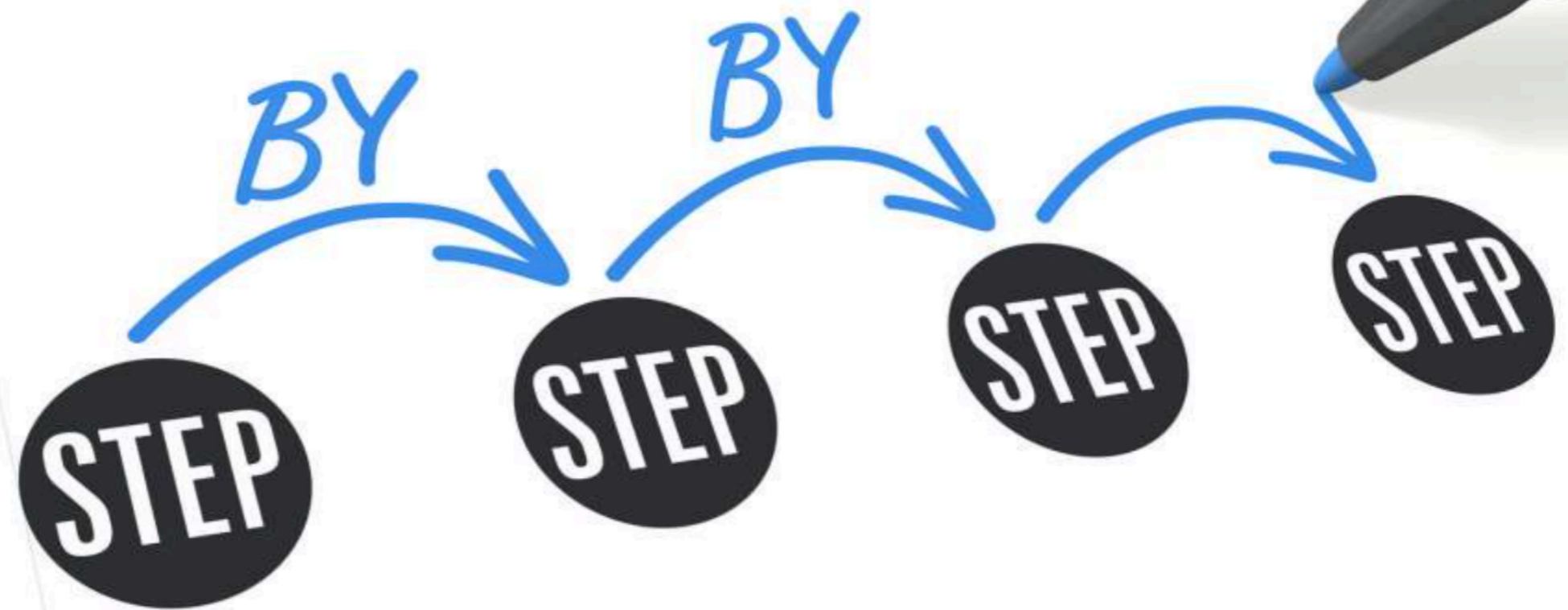
Optional libraries

- **X11** for simple graphical user interface and ray-tracing
- **OpenGL** for visualization
- **Qt4** or **Qt5** for graphical user interface
- **ROOT** for data analysis (even inside Geant4)

Less frequently used libraries/tools:

Motif, OpenInventor, DAWN, RayTracer X11, HepRApp, WIRED JAS Plug-in, AIDA, VRML browser, (external) CLHEP, Wt...

and now.... we can proceed with the Geant4 installation



Geant4 Installation

Download the code

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Overview

Geant4 is a toolkit for the simulation of the passage of particles through matter. Its areas of application include high energy, nuclear and accelerator physics, as well as studies in medical and space science. The three main reference papers for Geant4 are published in Nuclear Instruments and Methods in Physics Research A 506 (2003) 250-303, IEEE Transactions on Nuclear Science 53 No. 1 (2006) 270-278 and Nuclear Instruments and Methods in Physics Research A 835 (2016) 186-225.

Applications
A sampling of applications, technology transfer and other uses of Geant4
printer-friendly version

User Support
Getting started, guides and information for users and developers

Publications
Validation of Geant4, results from experiments and publications

Collaboration
Who we are: co-members, organization information

Software Download

Geant4 10.4 Software Download

Geant4 10.4
first released 8 December 2017 (patch-01, released 28 January 2018)

The Geant4 source code is freely available. See the [licence conditions](#).

Please read the [Release Notes](#) before downloading or using this release.
The patch below contains bug fixes to release 10.4, we suggest you to download and apply the latest patch for release 10.4 (see the additional notes for [patch-01](#)), or download the complete source with the patch applied; in any case, it is required to apply a full rebuild of the libraries.

Source files

Please choose the archive best suited to your system and archiving tool:

Download	GNU or Linux tar format, compressed using gzip (33.2Mb, 34842016 bytes) <i>After downloading, gunzip, then unpack using GNU tar.</i>
Download	ZIP format (46.9Mb, 49134809 bytes) <i>After downloading, unpack using e.g. WinZip.</i>

Data files (*)

For specific, optional physics processes some of the following files are required. The file format is compatible with Unix, GNU, and Windows utilities.

Download	G4NDL4.5, Neutron data files with thermal cross-sections - version 4.5 (402.2Mb, 421710294 bytes)
Download	G4EMLOW7.3, data files for low energy electromagnetic processes - version 7.3 (71.4Mb, 74875087 bytes)

Related Links

- [Previous Releases of Geant4](#) (since release 9.6).
- [LXR source code browser](#).
- [GitHub](#)
- [GitLab @ CERN](#).


Extract the file

```
$ cd Downloads  
$ tar -xzf geant4.10.05.tar.gz
```

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Data files (*)

For specific, optional physics processes some of the following files are required. The file format is compatible with Unix, GNU, and Windows utilities.

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Download	G4EMLOW7.3, data files for low energy electromagnetic processes - version 7.3 (71.4Mb, 74875087 bytes) NEW
Download	G4PhotonEvaporation5.2, data files for photon evaporation - version 5.2 (9.6Mb, 10084513 bytes) NEW
Download	G4RadioactiveDecay5.2, data files for radioactive decay hadronic processes - version 5.2 (1.0Mb, 1057501 bytes) NEW
Download	G4SAIDDATA1.1, data files from evaluated cross-sections in SAID data-base - version 1.1 (25.2kb, 25800 bytes)
Download	G4NEUTRONXS1.4, data files for evaluated neutron cross-sections on natural composition of elements - version 1.4 (2.1Mb, 2249001 bytes)
Download	G4ABLA3.1, data files for nuclear shell effects in INCL/ABLA hadronic mode - version 3.1 (104.8kb, 107286 bytes) NEW
Download	G4PII1.3, data files for shell ionisation cross-sections - version 1.3 (4.1Mb, 4293607 bytes)
Download	G4ENSDFSTATE2.2, data files for nuclides properties - version 2.2 (283.8kb, 290632 bytes) NEW
Download	G4RealSurface2.1, <u>Optional data files for measured optical surface reflectance</u> - version 2.1 (126.0Mb, 132130413 bytes) NEW
Download	G4TENDL1.3.2, <u>Optional data files for incident particles</u> - version 1.3.2 (558.0Mb, 585100935 bytes) NEW

- Low Energy Nuclear Data (LEND) files can be downloaded from: <ftp://gdo-nuclear.ucllnl.org/>

Create the “enviornment”

Geant4 folder

Build

**Source
code**

Install

Create the “environment”

Geant4 folder

Build

**Source
code**

Install

Automatically created

Copy the source code

Choose a path for your installation

```
$ cd Desktop
```

Create a new directory

```
$ mkdir Geant4  
$ cd Geant4
```

Copy the source code in the new directory

```
$ cd /home/user/Downloads  
  
$ cp -r geant4.10.05 /home/user/Desktop/Geant4
```

Copy the source code

Choose a path for your installation

```
$ cd Desktop
```

Create a new directory

```
$ mkdir Geant4  
$ cd Geant4
```

Copy the source code in the new directory

```
$ cd /home/user/Downloads  
$ cp -r geant4.10.05 /home/user/Desktop/Geant4
```

What?

Where?

Geant4 Installation

Create the folder build

```
$ cd /home/user/Desktop/Geant4  
$ mkdir geant4.10.05-build  
$ cd geant4.10.05-build
```

```
$ cmake -DCMAKE_INSTALL_PREFIX=/home/user/Desktop/  
Geant4/geant4.10.05-install  
-DGEANT4_INSTALL_DATA=ON  
-DGEANT4_USE_OPENGL_X11=ON -DGEANT4_USE_QT=ON  
/home/user/Desktop/Geant4/geant4.10.05
```

Geant4 Installation

set the *install directory*

the directory under which the Geant4 libraries, headers and support files will be installed.

the additional external data libraries are automatically downloaded

```
$ cmake -DCMAKE_INSTALL_PREFIX=/home/user/Desktop/Geant4/geant4.10.05-install -DGEANT4_INSTALL_DATA=ON -DGEANT4_USE_OPENGL_X11=ON -DGEANT4_USE_QT=ON /home/user/Desktop/Geant4/geant4.10.05
```

build the X11 OpenGL visualization driver

build the Qt visualization driver

Other Options

Important options:

- DCMAKE_INSTALL_PREFIX= ... installation_path
- DGEANT4_INSTALL_DATA=ON/OFF
- DGEANT4_BUILD_MULTITHREADED=ON/OFF

Further options:

- DGEANT4_USE_OPENGL_X11=ON/OFF
- DGEANT4_USE_QT=ON/OFF

.....

Geant4 Installation

Start the Geant4 installation

\$ make -jN

\$ make install



KEEP
CALM
AND
WAIT

and
wait....

```
[ 0%] Built target G4EMLOW
[ 0%] Built target G4NDL
[ 1%] [ 1%] Built target G4NEUTRONXS
[ 1%] [ 1%] [ 1%] [ 1%] Built target RealSurface
[ 2%] Built target RadioactiveDecay
Built target G4PII
Built target PhotonEvaporation
Built target G4SAIDDATA
Built target G4zlib
[ 4%] Built target G4global
make[2]: *** Pas de règle pour fabriquer la cible « /usr/lib/x86_64-linux-gnu/libGL.so », nécessaire pour « outputs/library/Linux-g++/libG4gl2ps
.so ». Arrêt.
make[1]: *** [source/visualization/externals/gl2ps/CMakeFiles/G4gl2ps.dir/all] Erreur 2
make[1]: *** Attente des tâches non terminées....
Scanning dependencies of target G4Intercoms
[ 4%] [ 4%] [ 4%] [ 4%] [ 4%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIAliasList.cc.o
[ 4%] [ 4%] [ 4%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWith3Vector.cc.o
[ 4%] [ 4%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWith3VectorAndUnit.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIbatch.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWithABool.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWithADoubleAndUnit.cc.o
[ 4%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWithADouble.cc.o
[ 4%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWithAString.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWithoutParameter.cc.o
[ 4%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcmdWithAnInteger.cc.o
[ 4%] [ 4%] [ 4%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcommand.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcommandTree.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIcontrolMessenger.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UImanager.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIDirectory.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UImessage.cc.o
[ 5%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UIparameter.cc.o
[ 5%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UISession.cc.o
/home/beilla/Software/geant4/geant4.9.6.p03/source/intercoms/src/G4UIcontrolMessenger.cc: In member function 'virtual void G4UIcontrolMessenger:
:SetNewValue(G4UIcommand*, G4String)':
/home/beilla/Software/geant4/geant4.9.6.p03/source/intercoms/src/G4UIcontrolMessenger.cc:328:21: warning: ignoring return value of 'int system(c
onst char*)', declared with attribute warn_unused_result [-Wunused-result]
    system(newValue);
    ^
[ 5%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4UnitsMessenger.cc.o
[ 5%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4VGlobalFastSimulationManager.cc.o
[ 5%] [ 5%] Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4GenericMessenger.cc.o
Building CXX object source/intercoms/CMakeFiles/G4Intercoms.dir/src/G4AnyType.cc.o
Linking CXX shared library ../..outputs/library/Linux-g++/libG4Intercoms.so
```

➔ each time you open a new shell **remember** to source the ***geant4.sh*** script before executing an application !!!

**Okay
that's all.**