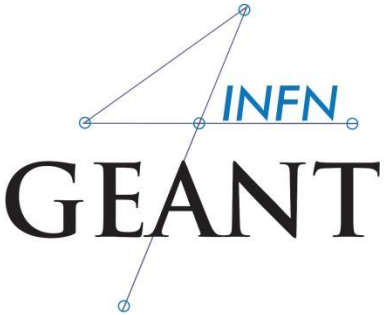


Geant4 Installation

Davide Chiappara
University of Padova (UNIPD)
Istituto Nazionale di Fisica Nucleare (INFN)

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

Supported platforms and requirements

Operating system:

- "recent" Linux (e.g. Centos 7/8/9) best support
- macOs 10.10+
- Windows 7+ (limited support, not recommended)

Compilers

- C++11compliance
  - such as Gcc 8+, clang 12+, Visual C++ 2019+

Cmake (Configuration generation tool): 3.16+

System libraries (as development packages):

- CLHEP, expat, zlib

Virtual machine: **Centos7** *with* **gcc 8.3.1**

These may or may not be necessary. Just remember system libraries if installation 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 3.16+ is not available:

  1. **download** the latest version (http://www.cmake.org/)
  2. **unzip** the tarball
  3. **./bootstrap**, **make**, **make install**

- **macOS**: install it using the Dawring64 dmg installerpackage
- **Windows**: install it using the Win64 exe installerpackage

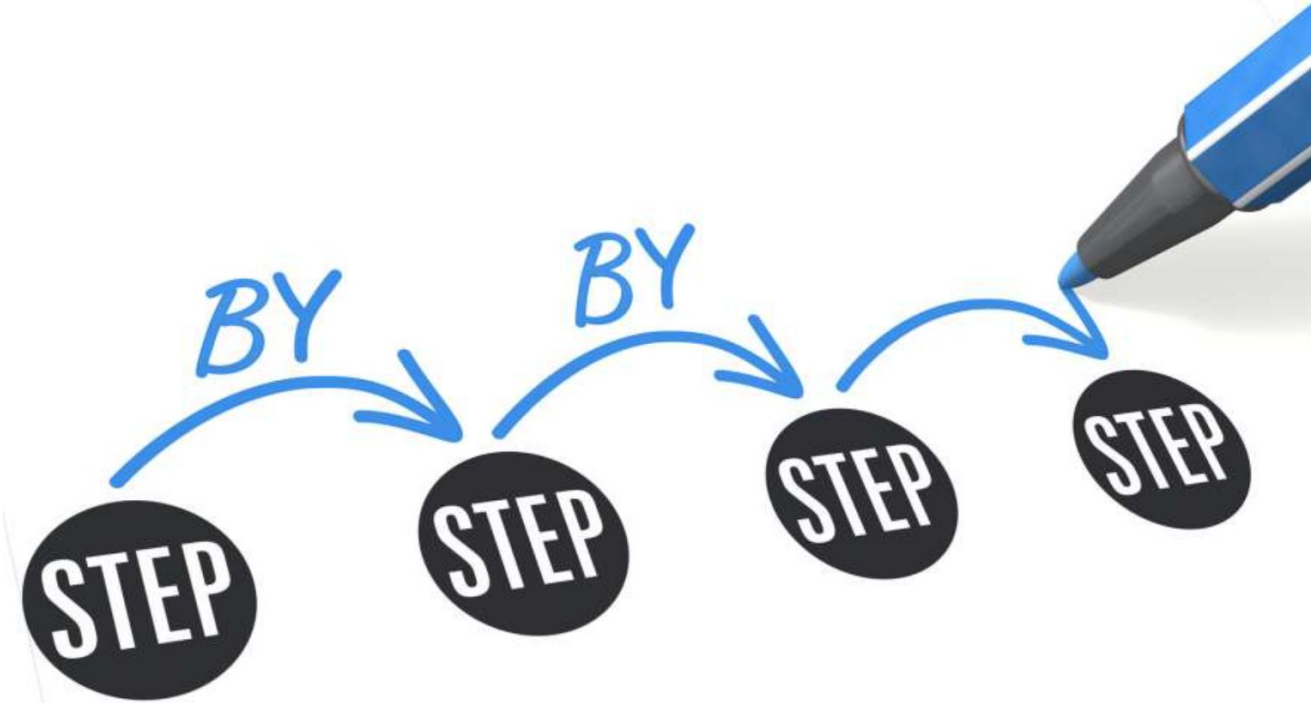
Optional libraries

- **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:

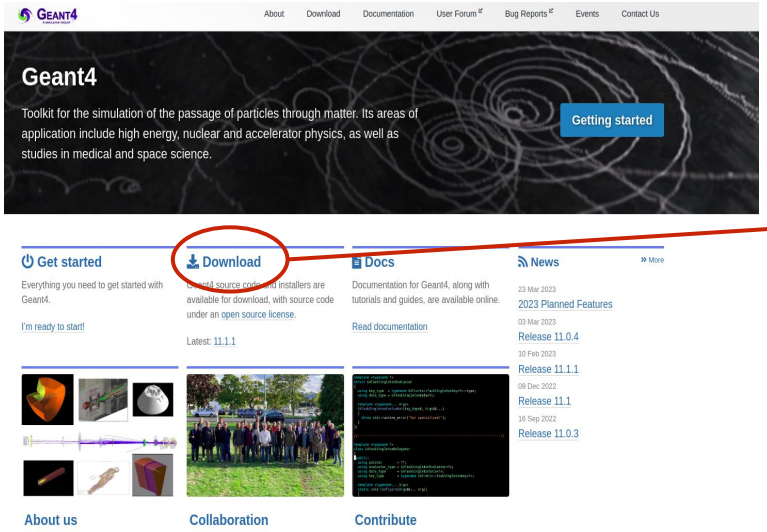
Motif, OpenInventor, DAWN, RayTracer X11, HepRApp, WIRED JAS Plug-in, AIDA, VRML browser, (external) CLHEP, Wt, …

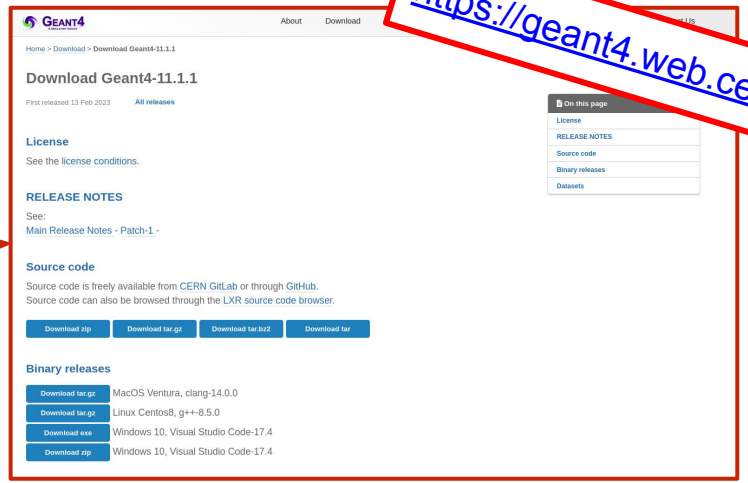
and now…. we can proceed with the Geant4 installation



Geant4 Installation

Download the code



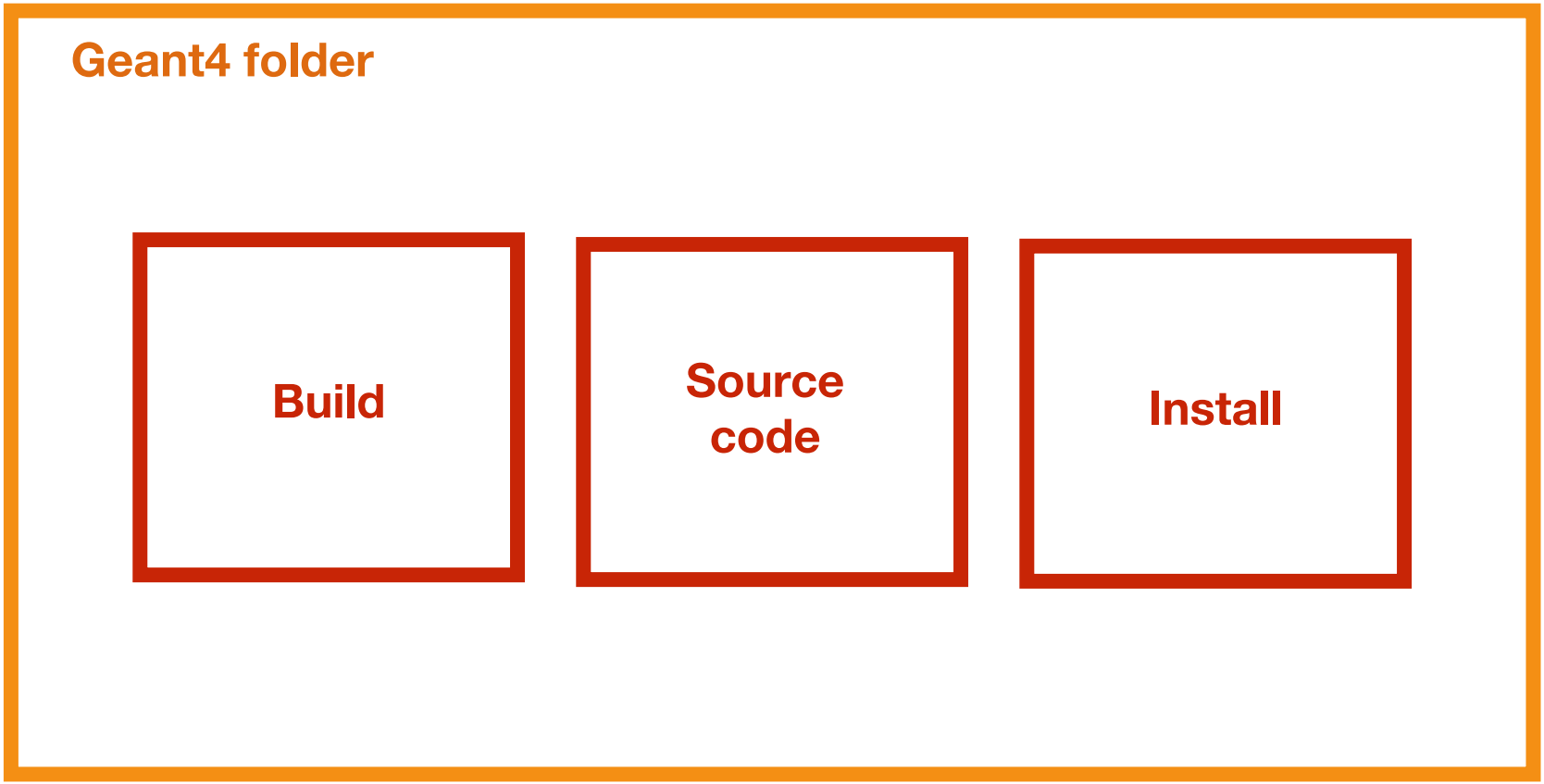


https://geant4.web.cern.ch/

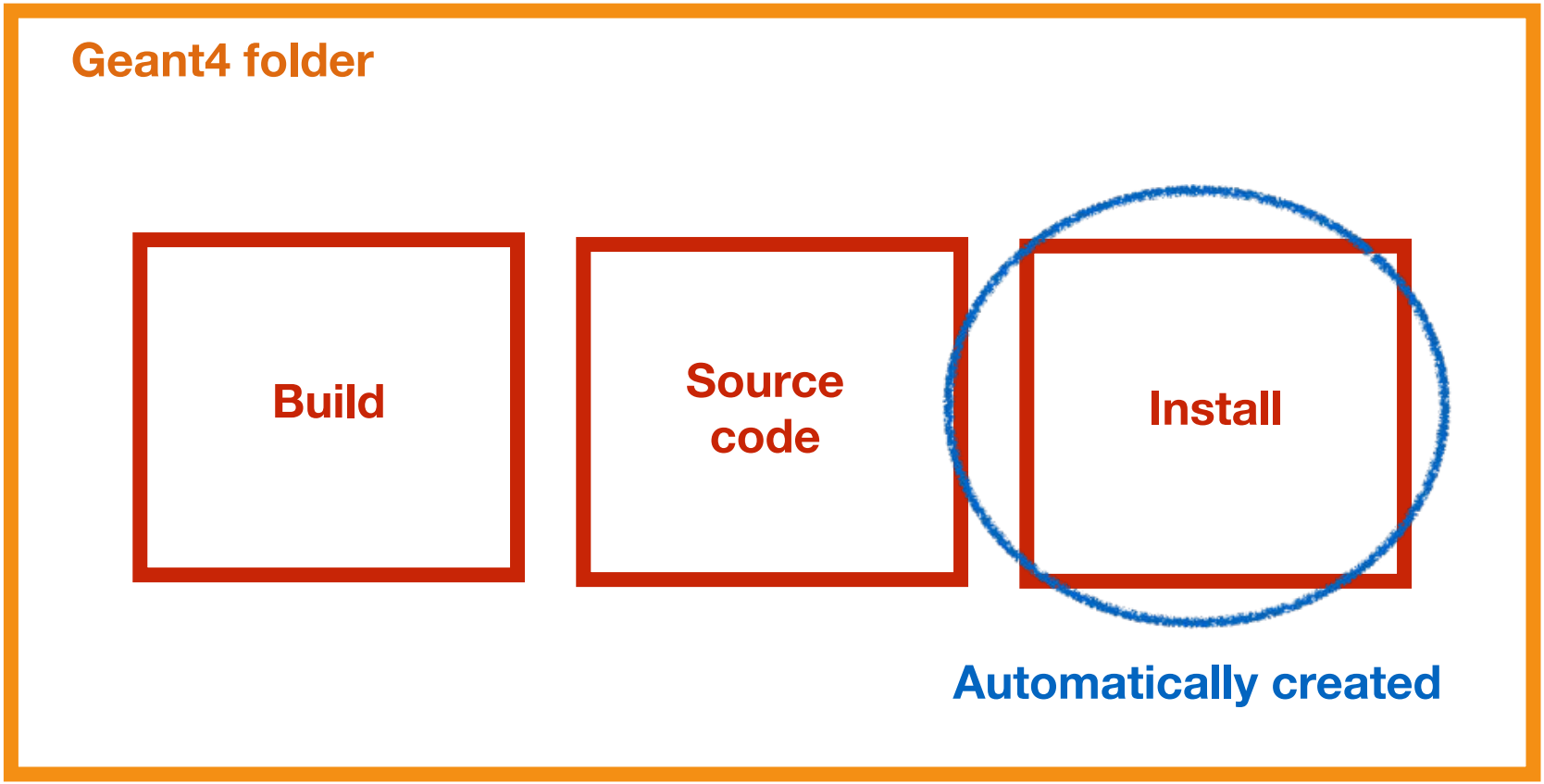
Extract the file

```
$ cd Downloads
$ tar -xzf geant4-v11.1.1.tar.gz
```

Create the environment



Create the environment



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-v11.0.1 /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-v11.0.1 /home/user/Desktop/Geant4
```

What?

Where?

Prepare the environment

Create the folder build

```
$ cd /home/user/Desktop/Geant4
$ mkdir geant4-v11.1.1-build
$ cd geant4-v11.1.1-build
```

Configure the compilation

```
$ cmake
DCMAKE_INSTALL_PREFIX=/home/user/Desktop/Geant4/geant4-
v11.1.1-install -DGEANT4_INSTALL_DATA=ON
-DGEANT4_USE_OPENGL_X11=ON -DGEANT4_USE_QT=ON
/home/user/Desktop/Geant4/geant4-v11.1.1
```

Prepare the environment

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

Configure the compilation

```
$ cmake
DCMAKE_INSTALL_PREFIX=/home/user/Desktop/Geant4/geant4-
v11.1.1-install -DGEANT4_INSTALL_DATA=ON
-DGEANT4_USE_OPENGL_X11=ON -DGEANT4_USE_QT=ON
/home/user/Desktop/Geant4/geant4-v11.1.1
```

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

……

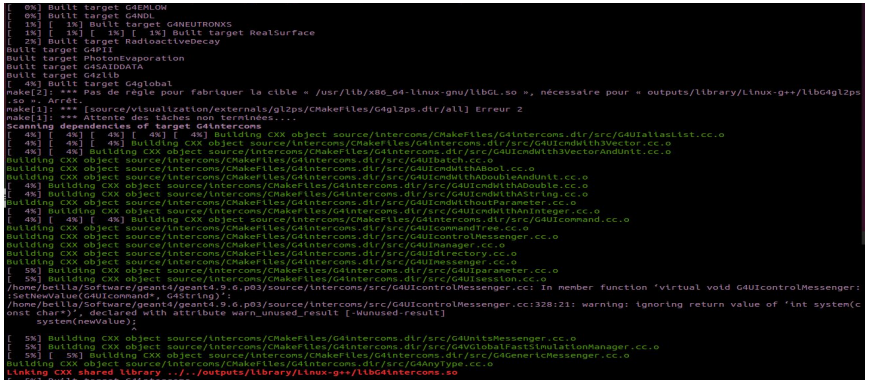
https://geant4-userdoc.web.cern.ch/UsersGuides/InstallationGuide/html/installguide.html#geant4-build-options

Geant4 installation

Start the Geant4 compilation and install

```
$ make -jN
$ make install
```

and wait....



each time you open a new shell ***remember*** *to source the*

`geant4.sh` *script before executing an application !!!*

Okay
that's all.