

Installing OP2

Dr. Satya Pramod Jammy

Research Fellow, University of Southampton
email1: s.p.jammy@soton.ac.uk
email2: j.satyapramod@gmail.com

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Hello, Prathana and Amrita,

This document gives an overview to install OP2. The readers are assumed to have knowledge of working with Linux like machines from a terminal, (i.e changing directory etc). If not please do get in touch with me. Also, in all the commands below, \$ already exists in a terminal.

Downloading

To download OP2, there are two options (a) download as a zip file from <https://github.com/OP2/OP2-Common> or (b) cloning it from github. It is always advised to clone it using git. I suggest creating a directory called ‘softwares’ in your home directory (I generally use this to install any other packages required like HDF5 etc.) to get OP2. This will be referred to as installation directory from now on.

For option (a) go to the OP2 github page, click on clone or download and an option for downloading zip appears, click on it and save it to the installation directory, a screen shot of it is shown in figure 1.

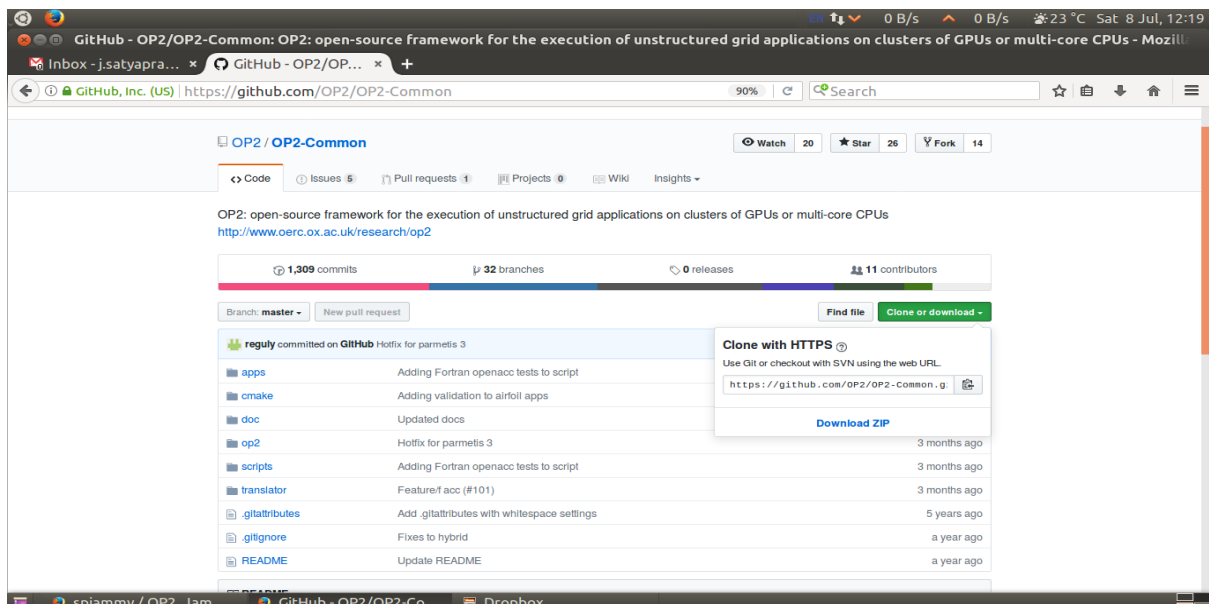


Figure 1: Screenshot showing the download zip option on Github

For option (b) ‘git’ needs to be installed on the machine, Ubuntu mostly has git already installed, to check if it is installed type the git clone command shown later. If not installed the command for installing git is:

```
$ sudo apt-get install git
```

Once 'git' is installed, then the user needs to clone the OP2 repository. Make a directory where you want to clone OP2 to (installation directory). Now open a terminal and change the working directory to the installation directory. Now, clone the repository, to do this type the following in a terminal after changing to the installation directory.

```
$ git clone https://github.com/OP2/OP2-Common.git
```

After this step, there will be a folder called 'OP2-Common' in the installation directory. These are the source files for OP2 and downloading via 'git' is complete.

Installing

OP2 can be installed for various backends, such as sequential, MPI, openmp, CUDA, HDF5 etc. At the initial stages of your project, we will concentrate on installing just sequential and openmp (if working) OP2 backends, (dont worry if you were unable to compile openmp backend we can look at it later). To do this one should export environment variables for OP2. I suggest adding these to your 'bashrc'. Do the following, (you can use your favourite text editor, so as not to complicate things for a novice user I use gedit) in a terminal

```
$ gedit ~/.bashrc
```

Once you execute the above command in a terminal you can see your bashrc opened in 'gedit'. We should add OP2_INSTALL_PATH and OP2_COMPILER (which compiler one wishes to use for the code, as 'gcc' will be installed on ubuntu I will use that)

Go to the end of the file and add the following lines (I assume ~/softwares/ is where you downloaded OP2 else replace it with your OP2 path). 'gnu' refers to 'gcc or g++' compilers, if you wish to use other compilers we can look at it later.

```
$ export OP2_INSTALL_PATH=~/softwares/OP2-Common/op2
$ export OP2_COMPILER=gnu
```

Save the file and close it. Once you are done go to the terminal from where you opened 'bashrc' and type the following

```
$ source ~/.bashrc
```

Cross checking the environment variables

To cross check if all the environment variables are set correctly. Close all the existing terminals, and open a new one, if you type the following commands

```
$ echo $OP2_INSTALL_PATH
this should give you the location of OP2, one has set
using the export command
$ echo $OP2_COMPILER
this should show 'gnu'
```

If the above two commands show the correct locations, then we are set to install OP2. We will concentrate first on 'sequential' and 'openmp' only as explained earlier. First change the directory to OP2/c/ and do a make

```
$ cd ~/softwares/OP2-Common/op2/c/
$ make core
$ make seq
$ make openmp
```

None of the above commands should show an error, if there is an error it looks like the following recipe for target '' failed make: error. If sequential compiles and openmp fails then don't worry.

Testing installation

To test if OP2 has installed correctly, go to a terminal change directory to (OP2-common/apps/c/). Test the applications jac1 (both dp and sp) and jac2. To test any application, change the directory to that applications, example 'cd OP2-Common/apps/c/jac2/' and then type 'make jac_seq' to compile the application, to run the application type './jac_seq'. Similarly, make 'jac_openmp' (if openmp backend compiles) and run the application. These will print output to the screen like Results check PASSED!.

Example, for running the double precision solver in jac1 apps.

```
$ cd ~/softwares/OP2-Common/apps/c/jac1/dp/
$ make jac_seq
$ ./jac_seq
$ make jac_openmp
$ ./jac_openmp
```

Try this for other applications of jac2, jac1/sp/ etc.