

How to install and run Surfex in parallel mode on Ubuntu

When using the SURFEX Land Surface Model in offline mode (stand alone, without coupling with an atmospheric model).

Step-by-step guide

1. The installation is described [here](#). The specific installation steps of SURFEX are well described. Some information are added here about the softwares / libraries on Ubuntu 18.04 LTS that are necessary for installing and running the model: gcc/gfortran and open mpi.
2. 'direct' installation of the basic softwares
 - a. gcc installation is available from the libgcc-7-dev for example (sudo apt-get libgcc-7-dev)
 - b. open mpi is also available for a large number of packages from ubuntu [\[here\]](#). However, It is difficult to have a recent version. Most of the packages have version 2.1
 - c. Another possibility is to build open mpi from the source. [\[here\]](#)
 - d. then check version and path to the compilers and wrapper:
 - i. set up the environment so that gcc, mpifort, mpif90, mpicc point to the version you want by defining PATH and eventually LD_LIBRARY_PATH
 - ii. gcc --version (I have 7.3.0 version)
 - iii. mpirun --version (I have 3.1.2 version)
3. installation inside a conda environment
 - a. use a conda environment to define the environment variables
 - i. create an environment and define environment variables PATH, OMP_NUM_THREADS (not necessary for compilation but for run after) and LD_LIBRARY_PATH following this [guide](#). In PATH and LD_LIBRARY_PATH, I defined the path to target the open mpi version that I installed previously.
 - ii. then follow the installation steps of Surfex
 - b. create a conda environment with gcc and open mpi (conda install gcc)
 - i. open mpi has to be downloaded from the conda forge channel (conda install -c conda-forge openmpi)
 - ii. mpich2 is available on traditional conda channels but I was not able to compile with it.
 - iii. follow the installation steps of Surfex
4. running SURFEX in parallel
 - to run Surfex in parallel mode, use mpirun -n N PROG.exe where N is the number of cpus you want to run on and PROG is the program you want to run: pgd, prep or offline.

- Ubuntu 18.04 LTS
- 16 cpu available. 1 socket, 8 cores, 2 threads / core

Related articles

- [How to install and run Surfex in parallel mode on Ubuntu](#)