
COLONY (Linux)

This file briefly describes how to run COLONY on a Linux machine (The binaries of the program are for 64bit Linux, and may not work for 32bit Linux). It should be read together with the ColonyUsersGuide.PDF file, which gives much more details about the methods, inputs and outputs of COLONY and is thus highly recommended to read before starting the use of COLONY.

The zipped Linux package includes the following files:

- 1) colony2s.ifort.out
- 2) colony2s.gnu.out
- 3) colony2p.ifort.impi2015.out
- 4) colony2p.ifort.omp1.10.1.out
- 5) colony2p.ifort.omp1.8.4.out
- 6) colony2p.gnu.omp1.10.1.out
- 7) colony2p.gnu.omp1.8.4.out
- 8) Readme.pdf
- 9) ColonyUsersGuide.pdf
- 10) ColonyUpdateHistory.txt
- 11) colony2.dat
- 12) ColonyBatchRun.f90
- 13) ColonyBatchRun.out

The first two files are the binaries for serial run, compiled by Intel's compiler and by GFortran compile respectively. The 3rd, 4th and 5th files are the binaries for parallel run, compiled by Intel's compiler using Intel's MPI (version 2015), openMPI version 1.10.1 and openMPI version 1.8.4 respectively. The 6th and 7th files are the binaries for parallel run, compiled by GFortran compile using openMPI version 1.10.1 and openMPI version 1.8.4 respectively. The 8th file is what you are reading. The 9th is a detailed description of the COLONY program. The 10th file is a brief of the updating history of Colony. The 11th is an example dataset (example 1 described in the 9th file). The 12th and 13th files are the Fortran source code and Linux binary for batch run of COLONY. Please put all of these files in the same folder, called COLONY program folder hereafter.

1. Serial run

The binaries for serial run are colony2s.ifort.out and colony2s.gnu.out. To make a serial run of COLONY for the example dataset colony2.dat, simply go to the COLONY program folder and type (in terminal)

```
./colony2s.ifort.out
```

To run your own dataset, you need first to prepare a complete input file, providing all of the data and parameter values in the order and formats described in ColonyUsersGuide.pdf. You can use the default input file name colony2.dat (so there can be only one file with such a name in a folder), or any other file names. In the latter case, you need to specify the input file name by typing

```
./colony2s.ifort.out IFN:YourInputFileName
```

Note IFN (representing Input File Name, all capitals) is the key word, followed by the colon and your input file name.

The default binary for serial run is colony2s.ifort.out. It is much faster than colony2s.gnu.out.

2. Parallel run with multiple processes

For parallel run with multiple processes, you need openMPI 1.8.4, openMPI 1.10.1, or intel MPI 5.0 installed on your Linux machine. Most often, openMPI is already installed. If not, you need to download (openMPI is free) and install it.

There are several different implementations of MPI. Unfortunately, they are not compatible. A binary produced with one MPI implementation may not work with another MPI implementation. Even with the same implementation (say, openMPI), different versions (e.g. 1.8.4 vs 1.10.1) may also be incompatible. For this reason, I have provided several parallel versions of COLONY, compiled by different compilers with different MPI versions.

Choosing the right binary suitable for the MPI implementation and version number on your machine, you can start running the example dataset with 4 processes by typing:

```
mpirun -np 4 ./*.out
```

where * is one of the binary names. For an input file with a name different from the default (colony2.dat), the command line is

```
mpirun -np 4 ./*.out IFN:YourInputFileName
```

You may have to first type

```
chmod u+x *.out
```

in the COLONY program folder in terminal. Otherwise, they cannot be executed with an error message “permission denied”.

The default binary for parallel run is colony2p.ifort.impi2015.out. The 3 binaries compiled by Intel’s compiler (colony2p.ifort.impi2015.out, colony2p.ifort.ompil.10.1.out, colony2p.ifort.ompil.8.4.out) are much faster than those compiled by GNU compiler (colony2p.gnu.ompil.10.1.out, colony2p.gnu.ompil.8.4.out).

3. Batch run of multiple input files

ColonyBatchRun.out can be used to make a batch run of multiple input files. The runs can be serial or MPI parallel, as detailed in document ColonyUsersGuide.pdf.