Hands-on labs for MPI and OpenMP

During the Sommer of HPC training week the hands-on labs can be done on the vsc3 cluster.

But it's also possible to do the hands-on labs on other systems or even on your own laptops.

You will need a compiler for C, C++ or Fortran that supports OpenMP, and an MPI library. Only for MPI it is in principle possible to do the exercises also in python and using mpi4py.

If you have access to a system that has the required software installed, feel free to use that.

Local installation

Note that we will not provide support for local installations.

Linux

Linux users need to install the GNU compilers and a couple of MPI packages, e.g. for Ubuntu:

```
user@ubuntu$ sudo apt-get install gcc g++ gfortran
user@ubuntu$ sudo apt-get install openmpi-bin
user@ubuntu$ sudo apt-get install libopenmpi-dev
```

Mac

Mac users need to install compilers from the Xcode developer package. It is easiest to install MPI using the Homebrew package manager - here are Instructions on how to install Xcode and Homebrew.
Now install OpenMPI:

```
user@mac$ brew install open-mpi
```

Windows

One solution is to install the Linux Subsystem for Windows (https://docs.microsoft.com/en-us/windows/wsl/install-win10), a recent feature of Windows 10. This will allow you to run Linux terminal applications on Windows. Alternatively, you can install a Linux virtual machine (e.g. Ubuntu) and follow the Linux installation instructions above.

Another option would be to install MPI natively on Windows using the Intel Parallel Studio compilers and the Intel MPI library (free access for students https://software.intel.com/en-us/qualify-for-free-software/student).

Python

Instructions for conda: https://gjbex.github.io/Python-for-HPC/software_stack.html
(not yet field tested, so some changes are probably required but it is a first step)

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