3-step quick installation guide

i. Installing OpenMPI

Any other MPI implementation might work as well, but we know OpenMPI does work. In particular OpenMPI 3.0.0, but you can try the latest stable version.

In the following link you will find instructions on how to install OpenMPI with Intel compilers. It should be identical with GNU compilers, replacing icc by gcc, icpc by g++ and ifort by gfortran.

https://software.intel.com/en-us/articles/performance-tools-for-software-developers-building-open-mpi-with-the-intel-compilers

ii. Installing Boost C++ libraries

Uncompress the tar file to a folder, e.g. /Downloads/boost_1_62_0

Create an installation folder, for instance in /opt directory but not necessarily, e.g. /opt/boost_1_62_0

In the /Downloads/boost_1_62_0:

./bootstrap.sh --with-toolset=intel-linux --prefix=/opt/boost_1_62_0 # Or --with-toolset=gcc supposing you are using GNU compilers.

This creates file project-config.jam. Edit it and include the following line:

using mpi ;

There is a blank space between "mpi" and ";". Look for the file /boost/mpi/config.hpp and make sure that it contains the following line:

#define BOOST_MPI_HOMOGENEOUS

Only one "#". Then run:

./b2

and

./b2 install

For these last commands you must have permission to write in /opt/boost_1_62_0. You may need to update your python-devel package.

iii. Compiling the executable

1. In the tt_inverse3d folder, create a folder named build.

$ mkdir build

$ cd build

2. In build, create a shell script install.sh (must be executable). The following is an example, you might have to adapt it to your system:

#!/usr/bin/env bash # YOU PROBABLY NEED TO MODIFY THIS PATH

export CXX=g++

export CC=gcc

cmake_engine="cmake" # YOU NEED CMAKE

prof_options=""

intel_flags="-fp-model precise " # THIS IS FOR INTEL COMPILERS, JUST REMOVE IT IF YOU ARE USING GNU COMPILERS

impi_compile_flags=$(mpicc -showme:compile)

impi_link_flags=$(mpicc -showme:link)

flavor="Release"

boost_root="/opt/boost_1_62_0"

src="/home/bcsidefault/Escritorio/InstalacionTomo3D/tomo3D/tt_inverse3d" # YOU NEED TO CHANGE THIS PATH TO POINT TO YOUR tt_inverse3d DIRECTORY

cmd="$cmake_engine -DMPI_COMPILE_FLAGS=\"$impi_compile_flags\" -DMPI_LINK_FLAGS=\"$impi_link_flags\" -DMPIEXEC=mpiexec -DMPIEXEC_NUMPROC_FLAG="-np" -DCMAKE_BUILD_TYPE=$flavor -DBOOST_ROOT=$boost_root $src"

eval $cmd

3. You need to install latex, and particularly doxygen-latex, latex2html, framed (texlive-framed.noarch). However, you should be able to avoid that by editing the CMakefile in the tt_inverse3d folder and commenting out the lines related to latex. Latex is used to build the pdf documents for the user and installation manuals but you don't need that since they are already included in the package. It is something I need to modify because it is pretty much useless and can be annoying if you don't have or don't want to install latex.

4. Run the shell script:

$ ./install.sh

5. Still in build, run:

$ make