Compiling and Running ASPECT on TACC Stampede

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Setting up ASPECT on TACC Stampede is much easier than on previous systems since most of the necessary libraries are already correctly installed and configured. Following all the instructions in this document should allow you to start running ASPECT within 30 minutes.

For further information on Stampede you can also refer to the user guide at:

http://www.tacc.utexas.edu/user-services/user-guides/stampede-user-guide Also, please note that most parts of this document have changed since the previous version. Even if you have set up ASPECT before, please follow all sections of this document to make sure your current setup has all necessary updates.

1 Account

You first need to obtain an XSEDE account at http://portal.xsede.org/. If you need one send an email to cig-help@geodynamics.org.

2 Setup

1. To start edit your ∼/.bashrc file to load the correct modules. Update the file with the following in the section that says PLACE MODULE COMMANDS HERE and ONLY HERE:

   module load git
   module load gcc/4.7.1
   module load mkl/13.0.2.146
   module load cmake

2. Get trilinos on Stampede for compiling locally.

   mkdir $HOME/Downloads/
   Download a copy of trilinos from trilinos.org. When creating this document we used trilinos-11.12.1-Source.tar because it's a known working version for the dealii-8.2.1 version we install.

   scp trilinos-11.12.1-Source.tar loginname@stampede.tacc.utexas.edu:/work/02668/loginname/Downloads/

3. Obtain and run currently working script for installing trilinos, p4est, and deal.ii aspect-setup_stampede.sh

   Script is located in doc/install/aspect-setup_stampede.sh

3 Install trilinos, p4est, and deal.ii

Since some of these libraries require a long time to compile, it may take a long time to finish if it is done on a login node (which is shared with dozens or hundreds of other users). It is recommended you log onto a compute node when compiling. To do so, use the following command:

srun -p development -t 1:00:00 -n 16 –pty /bin/bash -l

You will need to modify the script if you choose to install a different version of trilinos. See comments within the script for additional information.

aspect-setup.sh trilinos
aspect-setup.sh p4est
aspect-setup.sh deal.ii

You should now have the following directory structure in $HOME/packages:

build deal.II p4est trilinos

4 Configure and build ASPECT

Here we assume you have a cloned version of ASPECT on github. cd $HOME/packages
git clone https://github.com/your_github_account_name/aspect.git
cd aspect
git remote add upstream https://github.com/geodynamics/aspect.git
git pull upstream master
mkdir build
cd build
cmake ..

You will get a lot of warnings, but as long as you see the following you are ready to compile.
– Generating done
– Build files have been written to: /home1/02668/loginname/packages/aspect/build

make -j8
cd ../

Check where you are located:
git branch

You should see:
∗master

Make a local branch for your work
git branch myproject
git checkout myproject