

- In week 39 and 40 we covered “Shared Memory Programming: Threads and OpenMP”. In week 40 we will start with “Distributed Memory Machines and Programming” including MPI (Chapters 6 and 7 in the course book). After that we will start with Chapter 3 of the course book.
- Note also that you are responsible if you use too much computation time on the super-computer(s). Please be very careful wrt. jobs that need a large amount of computational needs. Please check the NIM web interface at <http://www.nersc.gov/nusers/accounts/nim/>.
- The second mandatory programming assignment will be published on Oct. 6th.
- In contrast to the method on Edison or Cori (see for example <http://www.nersc.gov/users/computational-systems/cori/running-jobs/>, <http://www.nersc.gov/users/computational-systems/edison/running-jobs/>), MPI programs are started with `mpirun` on the IMADA pool. This has also been discussed in week 40. You have to make sure that it is possible to login to all machines you want to use via `ssh` without being asked for your password. This can be accomplished with `ssh` keys as follows. SSH keys allow authentication between two hosts without the need of a password. SSH key authentication uses two keys a private key and a public key. To generate the keys, from a terminal prompt enter:

```
ssh-keygen -t rsa
```

This will generate keys using a DSA authentication identity of the user. During the process you will be prompted for a password. Do not enter a password. Simply hit Enter when prompted to create the key. By default the public key is saved in the file `~/.ssh/id_rsa.pub`, while `~/.ssh/id_rsa` is the private key. Now append `id_rsa.pub` to `~/.ssh/authorized_keys2`. (On the IMADA pool all machines use the same file system, therefore this is not a remote operation. If you want to login to another remote machine without being asked for the password, you have to append the key to the corresponding file on the remote machine):

```
cat id_rsa.pub >> .ssh/authorized_keys2
```

Finally, double check the permissions on the `authorized_keys2` file, only the authenticated user should have read and write permissions. If the permissions are not correct change them by:

```
chmod 644 .ssh/authorized_keys2
```

You should now be able to SSH to the host without being prompted for a password. Note that you have to login to all machines that you want to use once manually and answer the question

Are you sure you want to continue connecting (yes/no)?

once.

In the directory `/home/daniel/bin` on the IMADA pool you will find three small scripts to check the status of the pool machines, and to update a file that can be used as the hostfile of the `mpirun` command. The name of the files are

`imada-pinghost-nicelayout` , and
`imada-pollist-update.sh`.