SA-MIRI 2025

Practice Pa: Getting started

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Task 2.3 (optional) Enable passwordless ssh authentication

- Use to connect without password from a specific machine.
- SSH : private + public key allowing identification.
- Procedure : Generate a couple (s_k, p_k) of private (secret) and public key. Publish ONLY the public key on remote bsc account. It allows the account to check if the private key stored locally, but not simulate a connexion.

```
$ ssh-keygen -t rsa

$ ssh-copy-id nct01XXX@glogin1.bsc.es
```

Enter current password to validate

```
$ ssh nct01XXX@glogin1.bsc.es
```

Task 2.4 Transfer files using scp

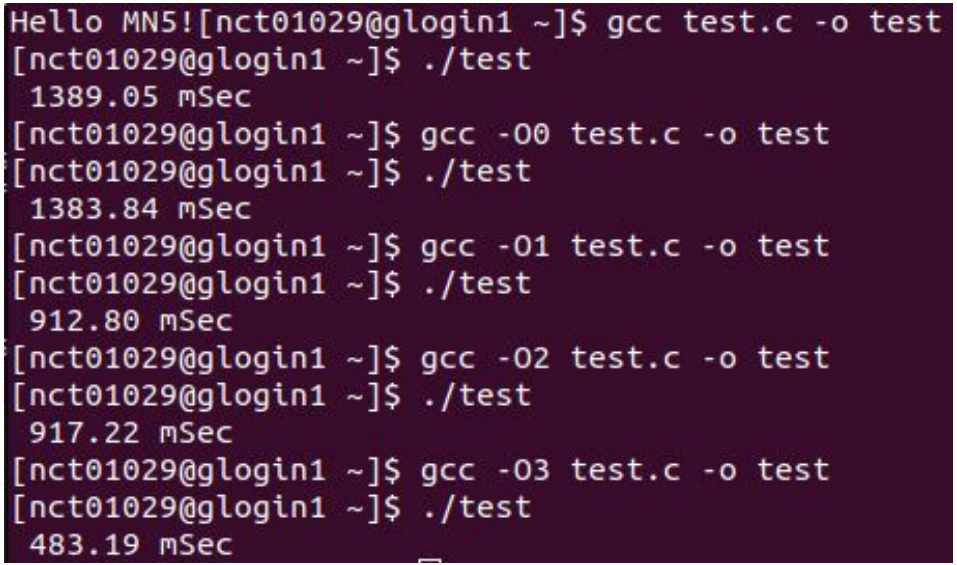
- copying file from local to MN:

```
C:\Users\kubas>scp -r C:\Users\kubas\testfile.txt nct01042@transfer1.bsc.es:/home/nct/nct01042
nct01042@transfer1.bsc.es's password:
testfile.txt                                                  100%   10     0.4KB/s   00:00
```

```
[nct01042@alogin1 ~]$ ls -l /home/nct/nct01042
total 1
-rw-r--r-- 1 nct01042 nct 10 Sep 19 11:47 testfile.txt
```

Task 3.1 Compare icx and gcc compiler optimizations

- `-O0` is the default option of `gcc`
- More advanced optimisation does not always lead to improvements (`-O1` VS `-O2`)



Task 3.1 Compare icx and gcc compiler optimizations

- `-O2` is the default option of `icx`
- More advanced optimisation does not always lead to improvements (`-O2` VS `-O3`)
- Without optimisation `icx` ≈ `gcc`, but `-O3` worked better with `gcc`

```
[nct01029@glogin1 ~]$ icx test.c -o test
[nct01029@glogin1 ~]$ ./test
 702.00 mSec
[nct01029@glogin1 ~]$ icx -O0 test.c -o test
[nct01029@glogin1 ~]$ ./test
 1341.20 mSec
[nct01029@glogin1 ~]$ icx -O1 test.c -o test
[nct01029@glogin1 ~]$ ./test
 912.21 mSec
[nct01029@glogin1 ~]$ icx -O2 test.c -o test
[nct01029@glogin1 ~]$ ./test
 701.01 mSec
[nct01029@glogin1 ~]$ icx -O3 test.c -o test
[nct01029@glogin1 ~]$ ./test
 702.20 mSec
```

Task 3.2 Reflecting on slurm job prioritization

Guidelines

- If possible, do not split jobs as size increase its priority (unless we do not want to overtake too much importance).
- Prioritize off-peak hours.
- Avoid unnecessary long jobs.
- Prioritize smaller queues (`gp_interactive`) if possible.
- Avoid launching jobs without testing locally beforehand (with smaller instances of the problem). Do not monopolise computation time with flawed scripts.
- Be aware of the usefulness of some jobs outside our class group (research).

Task 3.3 Submit your first slurm job

- `#SBATCH` lines : job parameters
- The rest : script to execute

- `sbatch test_batch.slurm`

```
#!/bin/bash

## SLURM JOB specifications
#SBATCH -t 00:10:00
#SBATCH --account=<account>
#SBATCH --qos=acc_debug

## SLURM JOB actions (actual job to execute)
echo "This is job $SLURM_JOBID \
on $(hostname) at $(date)"
```