TDDC78: Quick reference for Sigma

VER. 2022-04-05

!! See also NSC presentation slides + website and TDDC78 lab compendium !!

Before starting

SSH to Sigma: `ssh [Sigma username]@sigma.nsc.liu.se`

- Load compiler module:
  `module load buildenv-intel/2018.u1-bare`
- Select today's reservation, example:
  `usereservation TDDC78-2022-04-12`

Recommended compiler

C	`icc` / `mpiicc`
C++	`icpc` / `mpiicpc`

OpenMP: Add flag `-fopenmp`

SLURM commands

- `projinfo`
- see info about all projects you are member of.
- `listreservations`
  lists available reservations.
- `usereservation`
  set a reservation as default for this login session.
- `salloc`/`ompsalloc`
  request compute nodes when needed
  This is the **recommended way** to work in this course
- `squeue` (`-u` for your user, `-A` for a particular project)
  lists jobs, SLURMs view
- `sbatch`
  submits a jobscript to run later on the compute nodes.
- `scancel`
  cancels/deletes a job.
- `interactive`
  create interactive shell on compute nodes.
- `jobsh`
  ssh-like access to allocated nodes / job.

Using salloc

```
salloc <RESOURCE SPEC> mpprun ./bin [args]
ompsalloc <RESOURCE SPEC> ./bin [args]
```

Resource specification

- `-N` asks for a number of nodes, example (2 nodes, 64 cores): `-N2` (normally not used)
- `-n` asks for a number of tasks, example (16 tasks, 16 cores): `-n16`
- `-c` ask for a number of cores per task (for use with OpenMP):
  Example: `ompsalloc -c10` (> OpenMP run with 10 threads)
- `-t`, format is either minutes or hh:mm:ss, example: `-t60` or `-t1:00:00`

For debugging

Build with `-g` flag. Run in interactive mode:

- `interactive <RESOURCE SPEC>`

DDT

- `module load arm-DDT/21.0.1`

Graphical debugger, requires a ThinLinc session and **interactive** mode.

- `mpprun -ddt ./bin [args]`

ITAC

Run `additac` after loading modules but before building/running.
Build with `mpiicc -trace`
Start with `salloc` + `mpprun`
Analyze trace file (.stf) with `traceanalyzer [trace file name]`

Reservations for project liu-compute-2022-5

- `listreservations`

```
TDDC78-2022-04-12  from 2022-04-12T10:15:00 to 2022-04-12T12:00:00  [B]
TDDC78-2022-04-13  from 2022-04-13T13:15:00 to 2022-04-13T19:00:00  [A->A->B]
TDDC78-2022-04-19  from 2022-04-19T10:15:00 to 2022-04-19T12:00:00  [B]
TDDC78-2022-04-20  from 2022-04-20T13:15:00 to 2022-04-20T15:00:00  [B]
TDDC78-2022-04-27  from 2022-04-27T13:15:00 to 2022-04-27T17:00:00  [A->A]
TDDC78-2022-05-04  from 2022-05-04T13:15:00 to 2022-05-04T17:00:00  [B->B]
TDDC78-2022-05-06  from 2022-05-06T08:15:00 to 2022-05-06T10:00:00  [A]
TDDC78-2022-05-11  from 2022-05-11T13:15:00 to 2022-05-11T17:00:00  [A->A]
TDDC78-2022-05-12  from 2022-05-12T17:15:00 to 2022-05-12T19:00:00  [B]
TDDC78-2022-05-17  from 2022-05-17T10:15:00 to 2022-05-17T12:00:00  [B]
TDDC78-2022-05-18  from 2022-05-18T13:15:00 to 2022-05-18T17:00:00  [A->A]
TDDC78-2022-05-19  from 2022-05-19T17:15:00 to 2022-05-19T19:00:00  [B]
```

Outside of lab time

```
usereservation devel
```