# Computer system and software environment
# INTI

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# Computer system: partitions

Partitions:

- **haswell (32 nodes) => main partition for this VI-HPS**
- sandy/vihps (25 nodes) => reservation inside sandy, **backup only**
- knl => for afternoons, if some participants want to try…

```
> ccc_mpinfo
                    --------------CPUS------------  -------------NODES------------
PARTITION     STATUS  TOTAL    DOWN     USED     FREE     TOTAL    DOWN     USED     FREE     MpC   CpN SpN CpS TpC
---------     ------  ------   ------   ------   ------   ------   ------   ------   ------   ----  --- --- --- ---
sandy         up        3552        0     2183     1369      222        0      138       84     4000   16   2   8   1
knl           up         544        0      272      272        8        0        4        4     1323   68   1  68   1
skl           up          48        0        0       48        1        0        0        1     7916   48   2  24   1
knl           up         884        0        0      884       13        0        0       13     1544   68   1  68   1
haswell       up        1024        0        0     1024       32        0        0       32     4000   32   4   8   1
dgx           up          40        0        0       40        1        0        0        1     12500  40   2  20   1
atom          up         296        0        0      296       37        0        0       37     3625   8    1   8   1
armxg         up         352        0        0      352       44        0        0       44     7912   8    1   8   1
```

**MpC: memory/core (MB), CpN: core/node, SpN: socket (NUMA node), CpS: core/socket, TpC: thread/core (always print 1)**

# Haswell partition

Bi-sockets of E5-2698 v3 processors (Haswell-E, 16 cores / 32 threads per socket, 2.3 GHz)

Sub-NUMA mode => 2 NUMA nodes per socket

**128 GB RAM**

# Help !

Main commands and detailed documentation

```
> cat /etc/motd
> machine.info
```

Quick reference card (summary of next slides):
http://www.vi-hps.org/upload/material/tw26/INTI_quick_refv09.pdf

# Use modules

Print available modules

```
> module avail
> module avail mpi # filter to MPI modules
```

Print loaded modules

```
> module list
```

Load/unload modules

```
> module load/unload intel/16.0.3.210
```

# Submit jobs (1/3)

Interactive session (open a shell on a compute node)

```
> ccc_mprun -s -p haswell
```

Run a command (MPI application)

```
> ccc_mprun -p haswell -x -n 8 -c 4 ./bt.C8
-x: request exclusive usage of allocated nodes
-n: number of tasks to run
-c: number of cores per task
```

Submit a job

```
> ccc_msub <jobscript>
```

# Submit jobs (2/3)

Review your pending/running jobs

```
> ccc_mpp -u mylogin
```

Cancel/kill a job

```
> ccc_mdel <job ID, as given by ccc_mpp>
```

Misc.:

- **do not execute mpirun** on a login node (use ccc_mprun)
- sinfo, scancel, squeue can be used too (slurm)
- for outputs and intermediate results, prefer $SCRATCHDIR

# Submit jobs (3/3)

Jobscript example (passed to ccc_msub)

```
#!/bin/bash
#MSUB -x          # want to be alone on my node !
#MSUB -T 60       # max 60 seconds
#MSUB -q haswell # use the haswell partition
#MSUB -r btmz_impi_haswell          # job name
#MSUB -e btmz_impi_haswell.%I.out # stderr file name
#MSUB -o btmz_impi_haswell.%I.out # stdout file name
#MSUB -n 4 # nb tasks
#MSUB -c 8 # nb cores/task
set -x

module load ...
export OMP_NUM_THREADS=8
cd ...
ccc_mprun ...
```

# Backup reservation: sandy/vihps (if cannot use haswell)

Command line

```
> ccc_mprun ... -p sandy -E "--reservation=vihps" ...
```

Jobscript

```
#!/bin/bash
...
#MSUB -q sandy # use the sandy partition
#MSUB -E '--reservation=vihps'
...
```