There is a good section of the documentation about running on perlmutter: https://docs.nersc.gov/systems/perlmutter/running-jobs/#tips-and-tricks

So if you want to run on 4 cpu nodes with 1 task per node (so 4 mpi ranks) then you run with -c = 2\*128=256 which corresponds to all the cores on the node.

However, if your program would benefit from being broken down into more MPI tasks, say 8 per node, you can increase the tasks per node, and c will update accordingly to give you the correct number of nodes. (c=2\*128/8=32). This is the script generated by the jobscript generator for this example:

#!/bin/bash

#SBATCH -N 4

#SBATCH -C cpu

#SBATCH -q debug

#SBATCH -t 00:30:00

#OpenMP settings:

export OMP\_NUM\_THREADS=2

export OMP\_PLACES=threads

export OMP\_PROC\_BIND=spread

#run the application: srun -n 32 -c 32 --cpu\_bind=cores myapp.x

Does this answer your question? Best, Hannah

from: <https://docs.nersc.gov/systems/perlmutter/running-jobs/#tips-and-tricks>

sbatch/salloc CPU-only nodes

-A m3195

-C cpu

-c 2 \* [ 128/ tasks-per-node ]

#SBATCH --nodes=4

#SBATCH --ntasks=2

#SBATCH --cpus-per-task=128