

Introduction in High Performance Computing

Sheet 3

Tuning, Optimizing, Parallelization

Back to sheet 1, exercise 3. Copy the source file in directory `/scratch/HPC_I/E01/`. The program performs a classical conjugate gradient method for different sizes `n`. Compile and run the program with full usage of the vector extension (AVX) and compare different compiler flags in a table. (at least 4 different options and 2 compilers), that is 8 tabular entries. Use

`salloc --reservation=schuele --exclusive ./your_executable`

to run your program on one of the new skylake nodes. Use 4 different values for the size `n` (1000, 10000, 100,000 and 1,000,000).

Now that you know the program by heart try to vectorize it with OpenMP with best compiler option and all 4 values for the size. Does your parallel program scale - weak or strong?