

Parallel profilers



gprof

How to compile:

```
> cd hpc_lecture/profiler  
> g++ -fopenmp -O3 -mavx -mfma -pg 00_cpu.cpp
```

How to run:

```
> ./a.out 1024  
> gprof a.out  
> gprof -b a.out  
> gprof -bl a.out  
> gprof -blp a.out  
> gprof -bq a.out
```

PAPI

How to setup environment:

```
> export CPATH=$CPATH:/apps/t3/sles12sp2/free/papi/5.5.1/include  
> export LIBRARY_PATH=$LIBRARY_PATH:/apps/t3/sles12sp2/free/papi/5.5.1/lib  
> export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/apps/t3/sles12sp2/free/papi/5.5.1/lib
```

How to compile:

```
> g++ -fopenmp -O3 -mavx -mfma 01_papi.cpp -lpapi
```

How to run:

```
./a.out 1024
```

Vtune

Setup:

```
> module load intel-vtune
```

How to compile:

```
> g++ -fopenmp -O3 -mavx -mfma -pg 00_cpu.cpp
```

How to run:

```
> ampxe-gui
```

Reference:

https://software.intel.com/sites/default/files/managed/01/f9/hotspots_ampxe_win.pdf

nvprof

How to compile:

```
> nvcc 02_gpu.cu -lcublas
```

How to run:

```
> nvprof ./a.out 4096
```

```
> nvvp ./a.out
```

<http://on-demand.gputechconf.com/gtc/2012/presentations/S04I9B-GTC2012-Profiling-Profiling-Tools.pdf>

Score-p + Vampir

Setup:

```
> module load openmpi scorep vampir
```

How to compile:

```
> scorep mpicxx 03_mpi.cpp
```

How to run:

```
> export SCOREP_ENABLE_TRACING=true  
> export SCOREP_EXPERIMENT_DIRECTORY=scorep  
> ./a.out  
> cd scorep  
> vampir traces.otf2
```

<http://www.vi-hps.org/training/material/>