



Hewlett Packard
Enterprise

Practical sessions

Advanced LUMI Workshop

March 5–7, 2025



Materials Locations

- Slides will be uploaded soon after talks
`/project/project_465001726/Slides/HPE`
`Files *.pdf`
- Exercise notes and files (should include PDFs or Readme.md with instructions)
`/project/project_465001726/Exercises/HPE`
- Copy exercise files into your `$HOME` directory
 - If needed, unpack the exercise tar files with
`tar xf <file>.tar`
`tar xf <file>.tar.gz`



Setup

- Reservations are setup for use during the training (on LUMI-C and LUMI-G)
 - Use the following flags in the SLURM commands:
- To run the examples either use above options with sbatch/srun/salloc or you can also set SLURM environment variables, e.g.

```
export SLURM_ACCOUNT=project_465001726
export SLURM_RESERVATION=LUMI_advanced_cpu
```

(to be repeated for variables with prefix **SLURM_**, **SBATCH_**, **SALLOC_**)

- For convenience, we provide a script to setup your environment (copy from `/project/project_465001726/Exercises/HPE`):
 - `source lumi_c.sh` # LUMI-C
 - `source lumi_g.sh` # LUMI-G
 - ➔ It will change the prompt accordingly, remember to run ``exit`` before you switch environment



Exercises – Day 1 Introduction

- Exercise notes and files (should include PDFs or Readme.md with instructions)
/project/project_465001726/Exercises/HPE/day1
- Directory: **ProgrammingModels**
 - Session 1:
Make sure you can build and run the examples. Try different compilers and flags if there is time.
- Directory: **libsci_acc**
 - Session 2:
Test with LibSci_ACC, check the different interfaces and environment variables
- Directories: **debugging** (within directories)
 - Session 4:
Try the debugging tools in the debugging sub-directory



Exercises – Day 2 Introduction

- Exercise notes and files (should include PDFs or Readme.md with instructions)
/project/project_465001726/Exercises/HPE/day2
- Directories: **perftools-lite**, **perftools-lite-gpu**
 - Session 5:
Follow the Readme.md description and get familiar with the perftools-lite commands and outputs
 - subdirectory perftools-lite needs lumi_c.sh to be sourced
 - subdirectory perftools-lite-gpu needs lumi_g.sh to be sourced
- Directories: **perftools** (within directories)
 - Session 6:
Follow the Readme.md description (per each directory) and get familiar with the perftools commands and outputs
 - subdirectories perftools, perftools-api, perftools-hwpc, perftools-python, and perftools-apa need lumi_c.sh to be sourced
 - subdirectories perftools-for-hip and perftools-for-omp-offload need lumi_g.sh to be sourced
- Directories: **ProgrammingModels**
 - Session 7:
Test the Pi example with MPI or MPI/OpenMP on 4 nodes and 4 tasks
Show where the ranks/threads are running by using the appropriate MPICH environment variable
Use environment variables to change this order (rank-reordering)



Exercises – Day 3 Introduction

- Exercise notes and files (should include PDFs or Readme.md with instructions)
/project/project_465001726/Exercises/HPE/day3
- Directory: **VH1-io**
 - Session 10:
For I/O experiment with striping for the example.
ALTERNATIVELY look again at MPI with apprentice
If you did not do this yesterday, set **PAT_RT_SUMMARY=0**
– You get trace data per rank when you do this (huge file)
Set only 2 cycles in the input file (indat)
Use app2 on .ap2 file to see new displays (see help)





Questions?