NVIDIA

DRIVER/TOOLKIT/SAMPLES

ACCESS TO DEEPTHOUGHT2

- `ssh <username>@login.deepthought2.umd.edu`
- `cp -r ~gpu-k1c/maryland .`
- Use the modules environment system
  - `module load <ModuleName>` to load a module
  - `module list` to show which modules are loaded
- Use SLURM batch system. Every job submitted to the queue.
  - `sbatch`—submit a job to the queue
  - `squeue`—show all jobs in the queue
  - `qdel`—delete a job from the queue

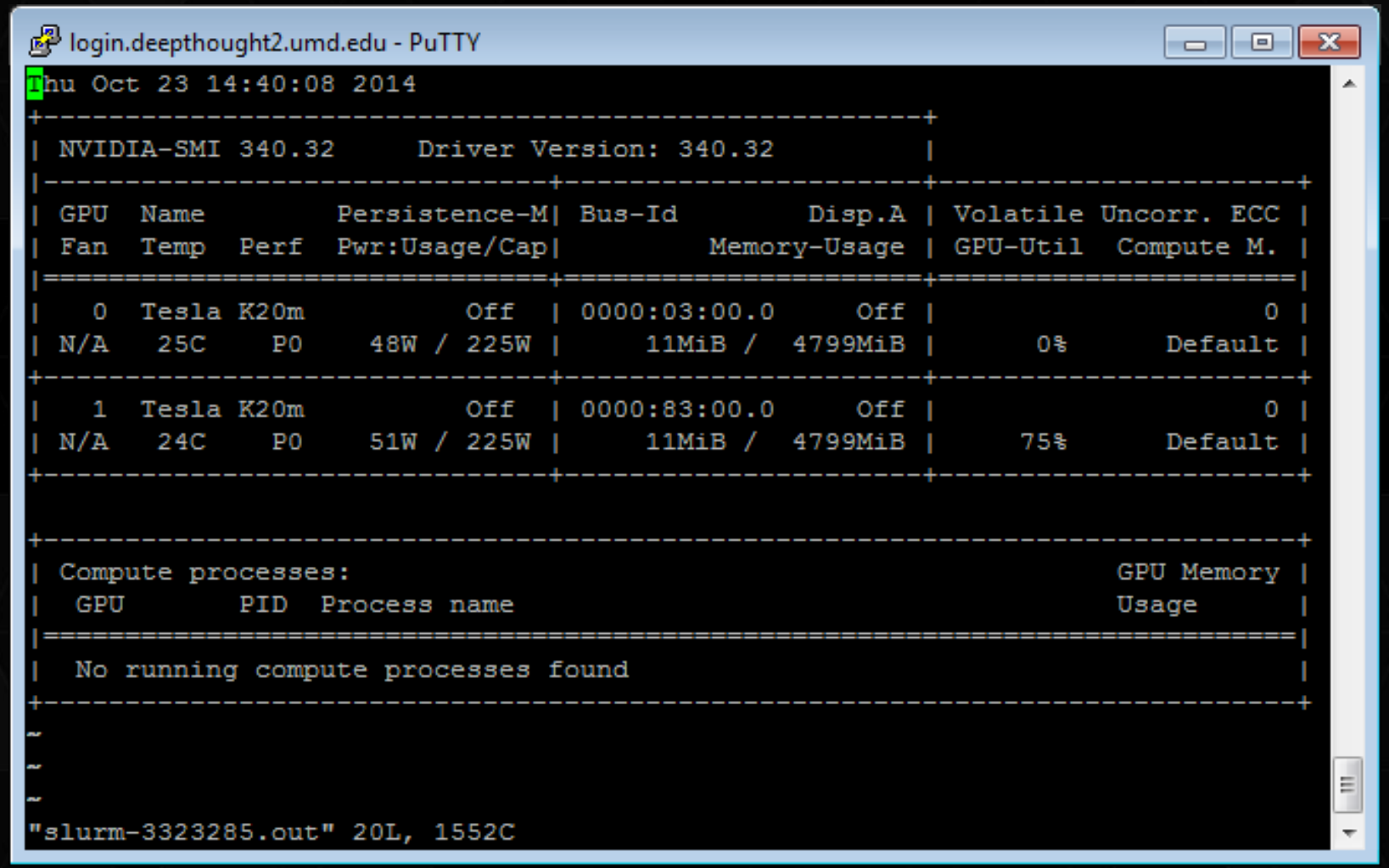
SOFTWARE

- GPU Driver
- CUDA toolkit
  - Includes all the software necessary for developers to write applications
    - Compiler (nvcc), Libraries, Profiler, Documentation
- CUDA Samples
  - Not strictly required but a good idea for ensuring your system is running properly.
  - Many examples with code samples illustrating lots of the important programming constructs and techniques.
- www.nvidia.com/getcuda Above software from NVIDIA is free

EXAMINE GPU H/W AND DRIVER

- **`nvidia-smi`**
  - -h for help
  - -q for long query of all GPUs
  - PCIe Bus ID
  - Driver Version
  - ECC state
  - Power State/Fans/Temps/Clockspeed
- **`sbatch runit.nvidia-smi`**
  - Open the resulting slurm-*.out file

nvidia-smi



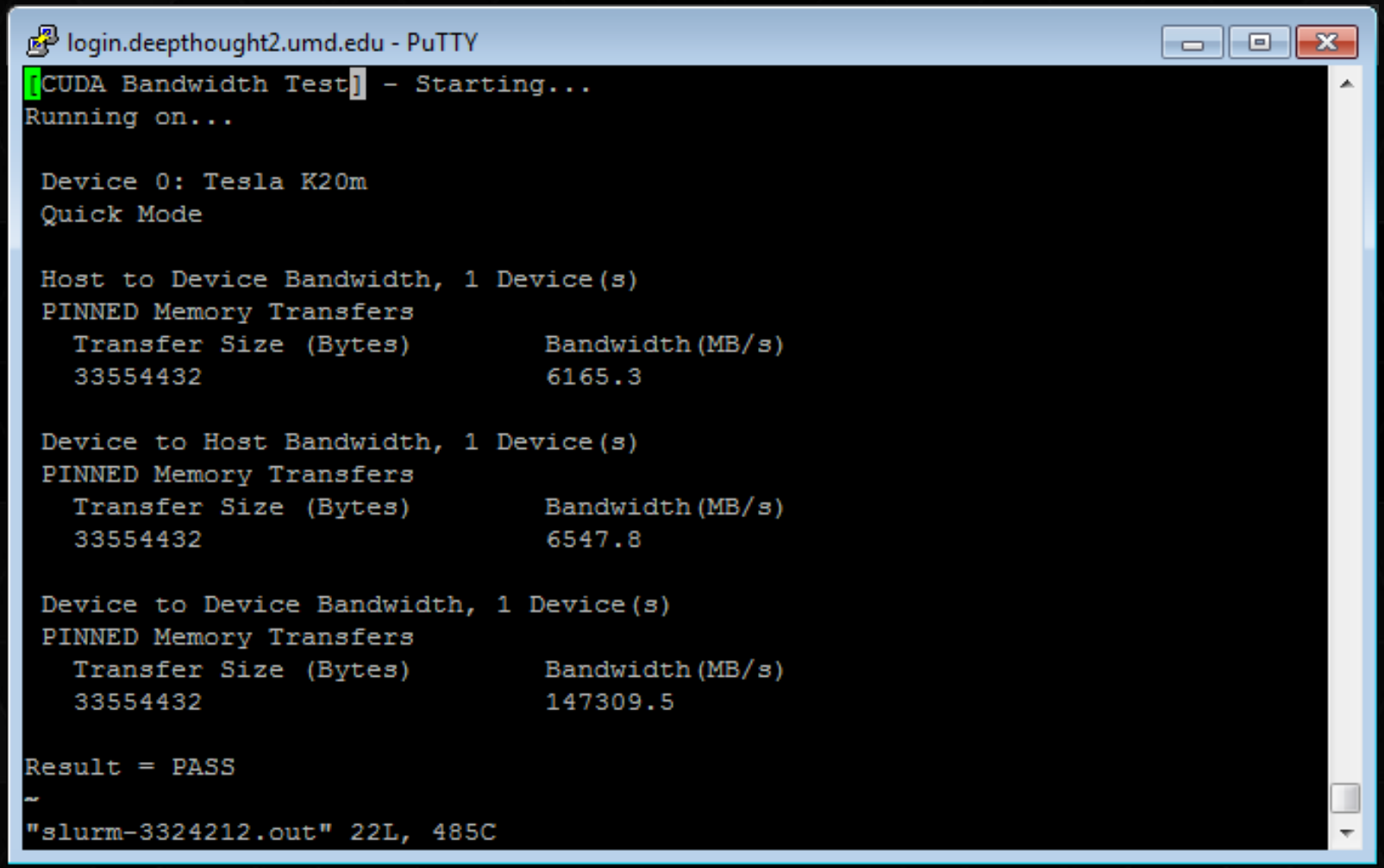
CUDA TOOLKIT

- `module load cuda/6.5.14`
- Compiler (nvcc)
- Libraries
  - BLAS, FFT, sparse, RNG, NPP, OpenCL
- Profiler
  - Visual or command-line profiling available.

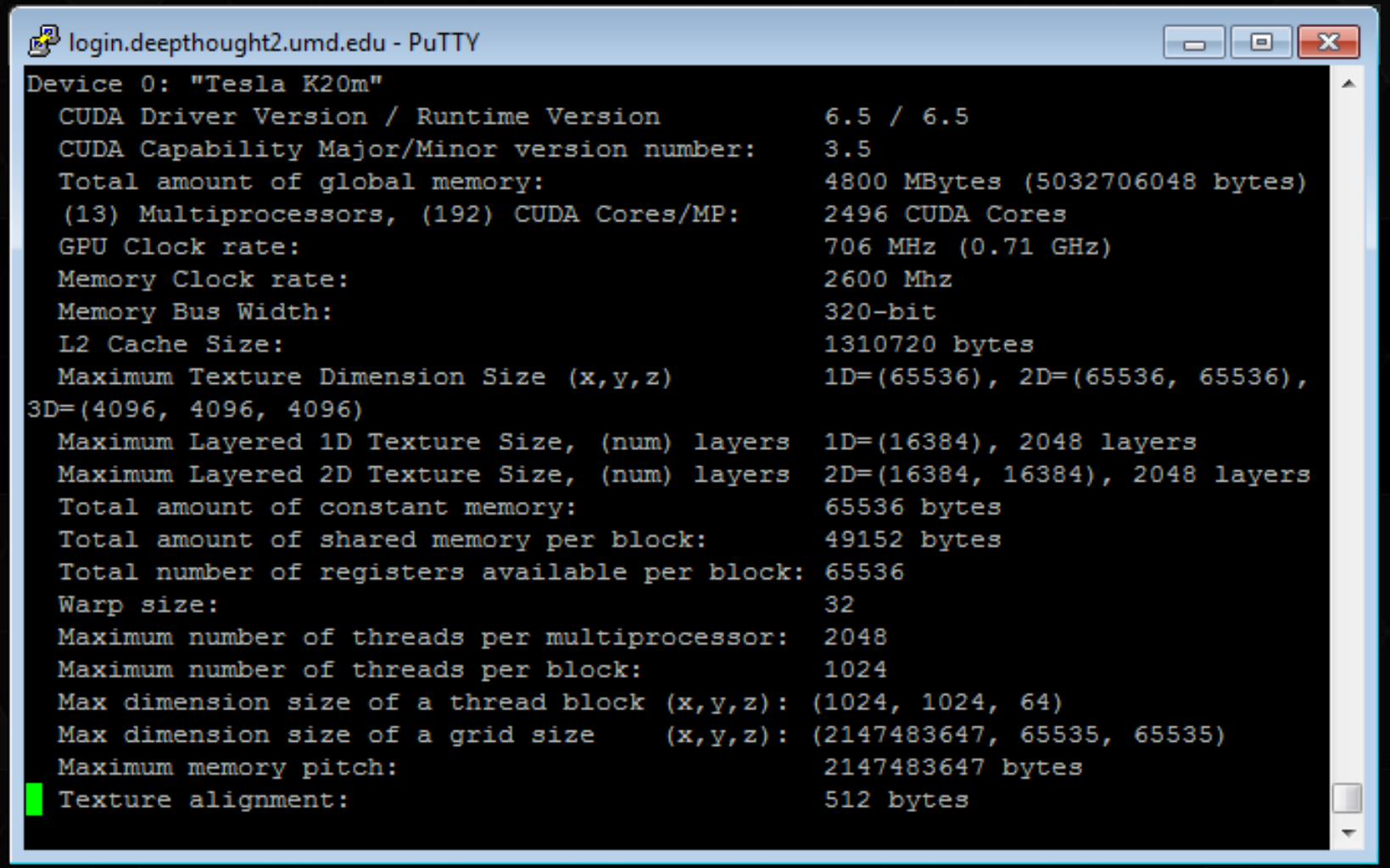
SAMPLES (COMES WITH CUDA TOOLKIT)

- `~gpu-k1c/CUDA65Samples/`
- Sample programs to illustrate CUDA and OpenGL programming constructs and algorithms.
- Useful diagnostic tests to query the GPU and its performance

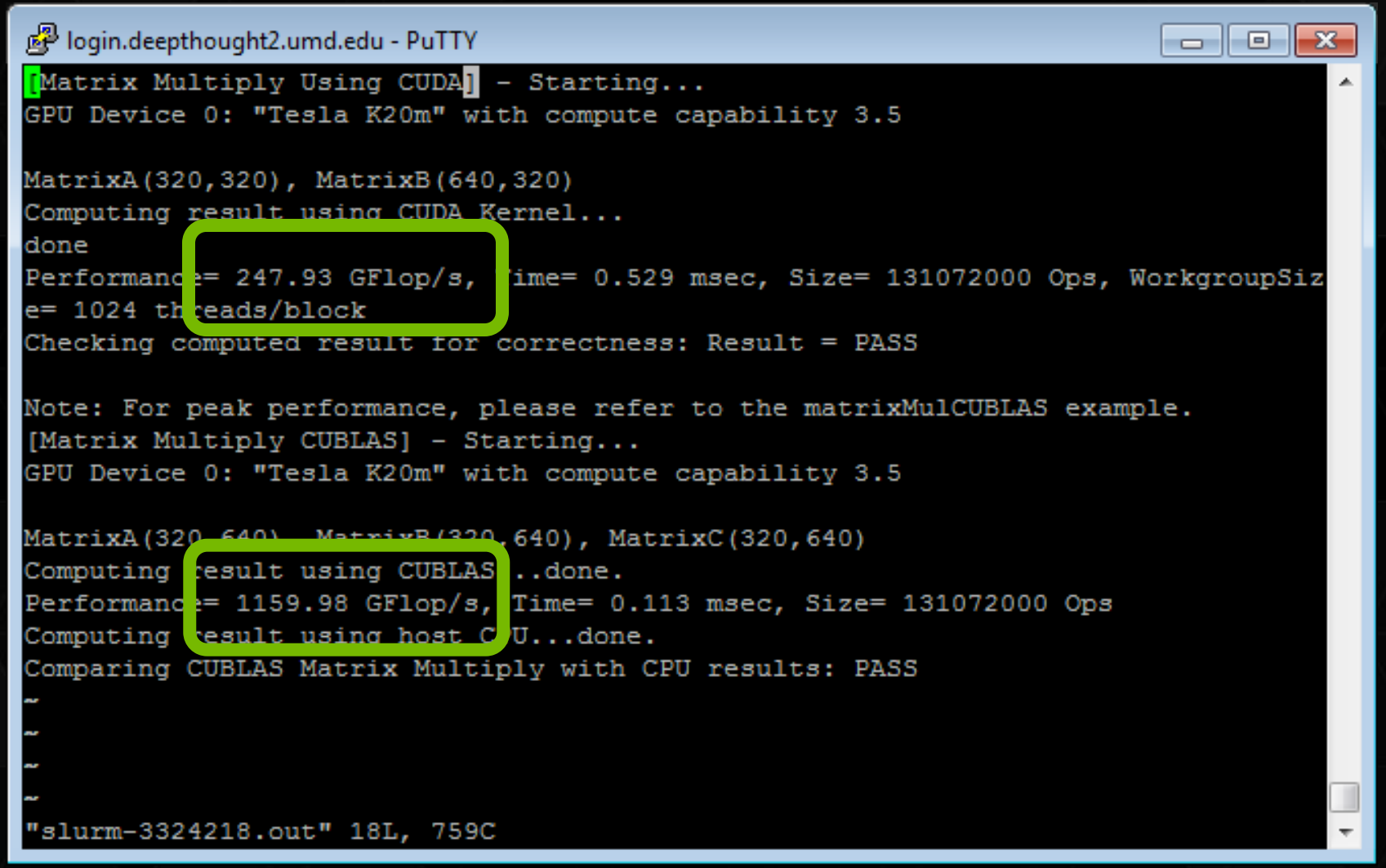
sbatch runit.bandwidth



sbatch runit.query ~gpu-k1c



sbatch runit.matmul ~gpu-k1c



RECAP

- Driver
  - `nvidia-smi` to query the GPU hardware and state
- CUDA Toolkit
  - Development tools for GPU programming
- CUDA Samples
  - Sample code as well as diagnostic tests