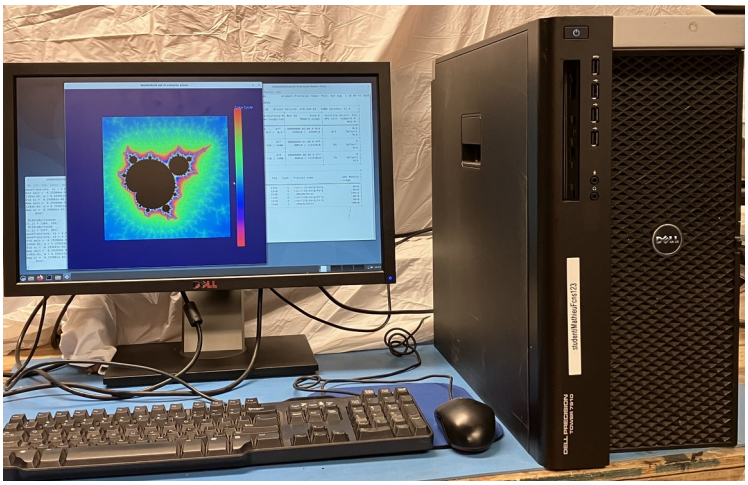
Dell T7910 budget supercomputer

This system was built from used/surplus parts. The total system cost was around $1000, placing machines like this well inside the budgets of students, academics, and hobbyists.



Hardware

- Dell T7910 chassis with 1300W power supply.
- Two CPUs: Intel Xeon E5-2687W (3GHz).
- 64 Gig DDR4 ECC RAM.
- 500 Gig hard drive.
- 1 NVidia K80 GPGPU card – supports 2 GK210 GPUs, 4992 cores total on card.
  - Special auxiliary 12V power cable.
- GPGPU card cooling: Dedicated fan and shroud on K80.
  - Special 12V power cable for fan.
- Graphics card: NVidia GT 730, DVI output.
- Tweaks to BIOS to support K80 card and cooing fans.

Software

The hardest part of configuring a such a system is identifying specific software versions which work with each other. This system uses the below software.

- Ubuntu 20.04, Cinnamon desktop environment.
- NVidia CUDA 11.4.48.
- NVidia K80 driver 470.256.02.
- GNU build environment: gcc/g++ 9.4.0.
- Cmake 3.31.
- VTK 9.6.
- Dev environment: emacs, git, etc.
- Other utilities & libraries as needed (installed using “apt install”).
- Example CUDA program: Mandelbrot set viewer.

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