MSI CUDA Tutorial

Operational Aspects of GPU Computing

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GPU Computing Requirements

• For computing on a GPU system, one must be provided a GPU processor through a graphics processing card. Special software (Cuda) allows users to directly access the GPU processors for computing...for this you must have a Cuda-Enabled GPU card.

• Cuda is relatively new and there are several versions. The latest supporting double precision arithmetic is version 2.0.
Resources

• MSI has been provided (by NVIDIA) twenty units of the GTX 480 GPU nodes. Sixteen of the are available in four nodes: gput0[1-4]. Each node has four GPU nodes.

• Users need to be members of the vglusers group in order to access the GPUs on the nodes.
Node Properties

• CPU: 2 x E5620 @ 2.40 GHz
• 16 total cores
• 24 GB of memory
• 4 x PCI x16 bus for GPUs
• 1 TB local storage
• Connected to all MSI standard home/authentication systems
• Setup with Virtual GL configurations
GPU Properties

• Cuda Driver Version: 4.10
• Runtime Version: 4.0
• CUDA Capability Version 2.0
• Cuda Cores: 480
• Global Memory: 1.5 GB
• GPU Clock speed 1.4 GHz
• Max Threads per block 1024
• 1 Concurrent Copy + Execution
• No memory ECC support
System Tools

• Nvidia tool: nvidia-smi
  – Not very useful for the Quadro cards
  – Only have access to memory, temperature

• deviceQuery
  – Lists the device properties (but not ownership or load)

• nvidia-settings
  – Useful for tuning x applications mostly
Cuda Toolkits

• In order to run codes on the GPU, you need to use special compiler directives which are provided by NVIDIA:

$ module load cuda
$ which nvcc
/usr/local/cuda/bin/nvcc

• Must be loaded in order to compile cuda software and run it.
New Acquisitions

• GPGPU system 8 nodes, 32 GPGPUs, IB connectivity
• 2 x Dell C410x
• 32 Tesla C2050s
• Available Late November
Hands-On Examples

- Login to the gpu nodes
- Modules available
- deviceQuery
- Running virtual GL