The OSU College of Engineering DGX System for Advanced GPU Computing

OSU’s College of Engineering bought six Nvidia DGX-2 systems

Each DGX server:
- Has 16 Nvidia Tesla V100 GPUs
- Has 28TB of disk, all SSD
- Has two 24-core Intel Xeon 8168 Platinum 2.7GHz CPUs
- Has 1.5TB of DDR4-2666 System Memory
- Runs the CentOS 7 Linux operating system

Overall compute power:
- Each V100 Nvidia Tesla card has 5,120 CUDA Cores and 640 Tensor Cores
- This gives each 16-V100 DGX server a total of 81,920 CUDA cores and 10,240 Tensor cores
- This gives the entire 6-DGX package a total of 491,520 CUDA Cores and 61,440 Tensor Cores

Performance Comparison with one of our previous Systems

How to SSH to the DGX Systems and Check on Them

ssh submit-c.hpc.engr.oregonstate.edu

submit-c 142% module load slurm

Do this to set your path correctly

submit-c 143%

sinfo

PARTITION AVAIL TIMELIMIT NODES STATE NODELIST
share* up 7-00:00:00 4 idle compute-9-[4-7]
dgx2 up 7-00:00:00 2 down* compute-dgxs-[4-5]
dgx2 up 7-00:00:00 1 dng compute-dgx2-6
dgx2 up 7-00:00:00 1 mix compute-dgx2-2
dgx2 up 7-00:00:00 1 idle compute-dgx2-3
gpu up 7-00:00:00 1 idle compute-gpu
cbee up 7-00:00:00 2 idle compute-b-25,compute-i-3
student up 7-00:00:00 4 idle compute-dgx2-1,compute-dgx-[1-3]
dgx up 7-00:00:00 1 idle compute-dgx3
eces up 7-00:00:00 6 idle compute-1-[8-13]

submit-c 144%
squeue

JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)
320 dgx2 zsh yangyi R 2-20:12:52 1 compute-dgx2-6
417 dgx2 zsh nguyenhu R 1-10:04:09 1 compute-dgx2-2
423 dgx2 bash nguyenkh R 1-06:31:52 1 compute-dgx2-2
424 dgx2 bash nguyenkh R 1-06:26:56 1 compute-dgx2-2
426 dgx2 mimi lehoang R 22:00:00 1 compute-dgx2-2

Check the queues
Submitting a job to the DGX Systems using Slurm

Create a shell file

submit.bash:

```bash
#!/bin/bash
#SBATCH -J ArrayMult
#SBATCH -A cs475-575
#SBATCH -p class
#SBATCH --gres=gpu:1
#SBATCH -o arraymul.out
#SBATCH -e arraymul.err
#SBATCH --mail-type=BEGIN,END,FAIL
#SBATCH --mail-user=jparallel@oregonstate.edu
./arrayMul
```

Submit the job described in your shell file

submit-c 143%

Submitted batch job 474

Note: A single dash (-) is used for a single character flag. A double dash (--) is used for a word (more than a single character) flag.

Double dash

Open an interactive shell on the DGX

srun --pty bash

bash-4.2$

```
./arrayMul
```