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Distributed

Lab 5

Compute: Stampede

This is the largest of computing systems on the XSEDE page. The compute nodes all use Intel Xeon E5-2680 processors. Each one of these CPUs has 16 cores. The system as a whole has 6400 compute nodes, with a total of 102400 processors. Each CPU has 2 GB of RAM, which brings the grand total of RAM to 200 TB. The system also has 128 NVIDIA Kepler 2 GPUs. all of this hardware gives a peak performance of 9600 Teraflops. This system is intended for applications that can be scaled to work on tens of thousands of cores.

Compute: Jetstream

This system isn’t as awe inspiring as the Stampede cluster. However, it is still respectable. Jetstream is built with Intel E5-2680v3 Haswell architecture CPUs. Each one of these CPUs has 24 cores. There is 5 GB per CPU, adding up to a total of 75 TB of memory across the whole cluster. The peak performance of the cluster is 516.1 Teraflops. Jetstream is a user-friendly cloud environment to provide students and researchers enough power to analyze large sets of data. It is really only meant for researchers that need only a handful of cores to run their software.

Visualization: Maverick

Maverick is a visualization cluster. It has 132 CPUs with 20 cores each. The system has 2640 cores all together. There is 12 GB per CPU and a total of 30 TB of memory across the whole cluster. There are 132 NVIDIA Tesla K40 GPU accelerators in the cluster. Maverick focuses on the GPUs because this cluster is specifically made to allow large data sets to be easily visualized. GUPs are the best tool for this job.

Storage: TACC Long-term tape Archival Storage (Ranch)

This system specializes in long-term mass data storage. It migrates data to/from magnetic tape. It has a storage capacity of 60 PB. It has about 640 TB of spinning disk storage space. All of the disk storage is ran by a single server with 16 cores and 72 GB. With all of the tape libraries that they have in this system, the theoretical maximum storage capacity is 200 PB of data. The purpose of this system is for long-term storage; for data that isn’t going to to changed a lot. They do warn that the data at the facility is not backed up because data loss from tape damage is rare. However it is a possibility.