Ohio Supercomputing Center Provides Students Remote Access to Clusters During COVID-19 Crisis

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Feb. 1, 2021 — Because of the COVID-19 pandemic, students at Ohio State University (OSU) and many other schools have had to adapt to remote learning situations. This proved to be especially challenging for work normally done in labs for a wide range of areas such as science, math, computer science, statistics, business, and other disciplines.

But, thanks to the Ohio Supercomputer Center (OSC), OSU was well prepared for the switch to remote learning. Plus, they were able to provide other universities with virtual laboratory portals as well. The center provides these virtual computer labs by offering students an easy-to-use web-based interface in a tool they developed called OnDemand. The students use customized dashboards developed by OSC for access to digital labs across multiple disciplines of classes including architecture, statistics, crop sciences, and more. When students log on to OSC OnDemand, they have access to an OSC supercomputer capable of running large workloads with advanced processing capabilities not typically available to users on their own computers.

Challenge

Historically, the high performance computing (HPC) community did their work via a command-line interface to enter system commands and move through files or directories, as well as run programs. Lack of a web-interface in HPC led to the perception that HPC work was lagging behind in ease of use.

Many students have only used web-based graphical user interfaces (GUIs) and are not interested in spending time learning about file systems, directories, and command line entries. Scientists and engineers would rather spend their time advancing their disciplines than learning HPC. Developing an easy-to-use web-based interface would lower the barrier to entry so that students, commercial clients, and government researchers have access to OSC supercomputer cluster systems.

Solution

Alan Chalker, Ph.D., Director of OSC Strategic Programs, explained that the inspiration behind OSC OnDemand was that every other technology developed web-based user portals so end-users could easily interact with the technology.

OnDemand is an accessible web interface that allows anyone with OSC access to log into and use one of the OSC supercomputer clusters. This would allow students, researchers, or commercial customers need to meet their most challenging data processing and research simulation needs.

OnDemand's novel architecture ensures that clients can utilize any modern web browser and helps utilize the underlying system security and user management.

OSC's OnDemand HPC environment includes clusters based on Intel Xeon Scalable processors. Pitzer, OSC's newest system, is an Intel Xeon Gold and Xeon Platinum processor-based cluster built by Dell. Recently this two-year-old, liquid-cooled cluster gained nearly 400 nodes and 20,000 cores, increasing the system to more than 650 nodes and almost 30,000 cores in total.

When students and customers log on to OSC OnDemand, they have access to a supercomputer capable of running large workloads with advanced processing capabilities not typically available to all users on their own computers. Running on an OSC cluster accelerates the time to insight during data analysis and works to lower the cost-per-terabyte during data processing.

OSC is also building customized OnDemand virtual remote dashboards for classes at other universities. For example, OSC created an OnDemand virtual lab for architecture students at Kent State University so that they can run Maya jobs that render complex drawing. "These are normally categories of students that wouldn't use HPC who are using it for coursework and being exposed to the power of HPC and supercomputers. Eventually, these students will take their exposure to using supercomputers into the workforce and realize the importance of access to high performance computing," stated Chalker.

OSC OnDemand Cluster Specifications Pitzer Cluster:

Owens Cluster:

- 824 Dell EMC PowerEdge server nodes
- Intel Xeon E5 2680 v4 processors

Click here for the full post.

Source: Intel