Computational resources available to the Biggs scholars

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Abstract

With the growing amount of data generated in medical research, it is becoming increasingly important, for research centers, to have computing infrastructure and capabilities that fit the needs of their research communities. As an institution with high standard, the Biggs institute is equipped with state-of-the-art facilities consisting of faculty-owned workstations, shared clusters, servers, cloud services and privileged access to external HPC like the Texas Advanced Computing Center (TACC). The Biggs Institute is also part of the UT Health San Antonio High Performance and Cloud Computing Research Facility (HPCF) which operates within UT Health San Antonio as a service unit of Information Systems and Management (IMS).

Overview

Biggs servers and users equipments

- Workstations: each with 40 cores, 256GB RAM, 16TB storage. NVIDIA Quadro P5000 16GB

- IMS-managed Computing servers: each with 104-cores, 512 GB RAM, 60 TB local storage.

- IMS-managed data storage: 1 PB research archival data storage system based on opensource Ceph storage platform

- Cutting-edge software for the analysis of multi-omics and imaging data.

UTHSCSA ALAMO Cluster

- 14 individual nodes that take and process jobs submitted from the master node.

- 360 CPU cores, 2 TB RAM

- 2 RAID 60 NAS units each with 88 TB storage connected via 10 Gbs infiniband interconnects

- Provides high performance computing resources for running multi-thread and distributed parallel computations.

UTHSCSA HPCH

- 4 Linux servers: 96-cores, 64-cores, 40-cores, and 16-cores, and each with 512 GB RAM, and up to 30 TB per systems for complex computation (>200 computation cores).

- 4 Linux servers: ~240 cores, and a Deep Learning enabled Nvidia V100 graphic card for accelerated machine learning tasks.

- 1 Linux server: 2x Quad-core Xeon 3GHz, 32GB RAM as dedicated MySQL database server

- 1 Linux server: (2x Dual-core Xeon per node) for dedicated Illumina pipeline (demultiplexing, data transfer, etc)

- 200TB storage: Through UTH Data Center, HNAS.

- ~ 1PB research archival data storage: The system is based on open source Ceph storage platform

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Conclusion

With the establishment of the multidisciplinary research environment at Biggs, large-scale projects are being launched involving big data analysis of multi-omics and imaging data. These data have posted high data storage and processing requirements. The computing facilities at Biggs provide powerful computing capabilities to its researchers, and allow them to successfully implement research projects at the frontiers of neuroscience.