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Sequencing helps in proliferating personalized medicine

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sgi

With the increasing trend of genomics analysis and a wave of personalized medicine taking over in healthcare industry, scientific researchers are in need of high computational instruments that enable next generation sequencing for genomics. The complexity and amount of data being generated during DNA sequencing is massive and the daunting task of data analysis require high-performance computing capability in one single platform. The ability to process, analyze, manage and ultimately act on this data is quickly becoming a critical element of a research project.

New aspect of drug discovery
Revolution in DNA sequencing is similar to the early days when printers were introduced. Earlier, the whole University used to have one big printer and it was shared among everyone and just as now every department or individual has his own printer, platform for DNA sequencing is getting more personalized.

In proliferation of DNA sequencing, there is production of huge amount of data and SGI is able to provide computing technology that has ability to handle high velocity, volume and variety of data of these analysis. In DNA sequencing, data is flowing out at a very high rate and one has to deal with the speed in real time avoiding any loss of data, creating a need for assimilating data in a high velocity. The next challenge in DNA sequencing is analysis of the fast outflow of data. In earlier days, in the process of data sequencing and assembly produced huge jumbled up genome that had to be manually arranged with the help of references. This has been a daunting task for researchers as it is a highly complicated and complex procedure. SGI has developed high performance computing technology that accelerates speed of data storage at one place and enables researchers to do smooth analysis.

Another area where computational technology by SGI is playing a key role is analysis of the drugs developed in labs. Currently, when a drug is developed, it is normally designed for across the population. Concept of personalized medicine is making researchers realize that everybody respond differently to each drug and each individual responds differently to a drug over a period of time. Hence, genomic analysis enabled by SGI plays a role in understanding the reaction of each drug in a human being over a different period of time. If the drug discovery companies are able to analyze this difference, it is easy to understand the response of a drug in future.

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Even a small variation in drug response makes a difference in treating a disease. SGI has deployed its machine in Pittsburg Super computer center and is used by large genome analysis center in US. Singapore has also installed the SGI machines for genome analysis and is used by National University of Singapore, Nanyang Technical University, Genome Institute of Singapore, Bioinfomatics Centre and others.

In DNA sequencing, it is speed and tailored quality drug that can be bring revolution in personalized medicine. In the time to come, computational analysis technology by SGI would help scientists to make genome based diagnostic a common phenomenon and when a patient goes for normal blood test, his genome analysis also becomes a part of overall diagnostic that would indicate future diseases.

High data storage

Life sciences research often requires significant chip memory (>2TB), accessible by all processes, to efficiently parallelize heterogeneous sets of equations. SGI Ultraviolet (UV) platform can drive huge efficiency gains in time-to-discovery for compute and data-intensive applications like computational biology, genome reconstruction, high content analysis and systems biology. SGI UV is the ideal platform to accelerate pace of innovation in all areas of decision support, genomics and bioscience, chemistry and materials, physics, integrative systems science, national security, product design, and other data-intensive fields. SGI UV is the only solution that currently leverages the power of Intel's latest CPU beyond 4 sockets and 1.5TB memory per system.

Currently, researchers have a scattered storage system that makes it extremely difficult to analyze and compare data and SGI's Ultraviolet (UV) machine enables RAMs in terabytes that enable storage of huge amount of data at one place. SGI UV operates just like a workstation and is far less complex to manage than traditional scale-out systems with many nodes. Further, applications can scale without the complexity of multi-instance software. Because of the huge capacity available on SGI UV, users can consolidate complete workflows in a single system, with the lowest IT burden per compute core versus comparable clusters or scale-out systems.

(As told to Ms Amrita Tejasvi)