Life Sciences Evolution Timeline

How HPC storage is accelerating the time to discovery

The advances in life sciences computing are remarkable, especially given how quickly they're being made, and the massive amounts of data being generated by the industry require storage capable of massive throughput. Cray has been — and will continue to be — an integral part of those advances.

EARLY ADVANCEMENTS

2000

THEN

Sequencing a complete human genome cost $1 billion and several person-years of effort; the size of the sequencing data was limited.

NOW

Today, genome sequencing costs are far lower and have triggered data explosion; more and larger sequencers can be produced quickly.

2012

THEN

Cray breaks the storage bottleneck with the 1 TB/s "Blue Waters" system at the National Center for Super-computing Applications.

NOW

That system is still running — and sustaining those speed rates!

2015

THEN

Data overload in healthcare and life sciences? A false threat!

NOW

The time for big data has come, and our ability to process it all must keep up with the vast amounts of data being generated.

TODAY

HPC enables:

- Next-gen sequencing and analysis
- Better disease control/improved health
- Accelerated drug and device development
- Precision medicine

The enormous amounts of data involved in life sciences make storage and data management the biggest bottleneck for modern applications.

The demanding I/O requirements of the life science workflow break the scalability of the traditional storage solution. A high-performance parallel file system such as Lustre® or Spectrum Scale are needed to accelerate I/O-intensive workloads.

Cray® ClusterStor™ Storage Systems are industry-proven, performance-optimized solutions that accelerate the modern life science workflow with unprecedented performance, efficiency, reliability and ease of use.

Cray ClusterStor solutions become the #1 choice in new HPC storage installations and breaks another speed barrier of over 1.7 TB/s, implementing storage for Los Alamos National Laboratory's "Trinity" supercomputer.

Supercomputers are:

- Advancing understanding of Hepatitis B and discovering new therapies
- Investigating brain synapses to aid in Alzheimer's research, schizophrenia and manic depressive disorders
- Helping make advances in cancers caused by radiation therapy, and heart disease

2020 & BEYOND

EXASCALE

The future of HPC is exascale; exascale will set us on the path to chemically resolve details of the cell. A human cell is about 10 micrometers long and we can simulate it at a scale of about 1/100th to 1/1000th of that today. **Soon we will reduce it by a factor of 10, requiring a computer 1,000 times as powerful! A powerful HPC storage solution is needed to line up with this kind of computing speed.**

HPC

HPC technology will end the "one size fits all" medicine and **allow for more individualized treatments.**

Companies must update their computing infrastructures to plan for the future. **It will be too costly to cut corners or do nothing at all.**

IMPACT

Next-gen storage will power a "learning system" that helps identify patterns and correlations of diseases, treatments and outcomes, giving physicians a **head start in identifying effective treatments, publishing results and spreading the word.** HPC technology will positively affect our lives in the areas of **nutrition, disease control and precision medicine research.**

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