

## **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

### **THEN**

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

### THEN

Cray breaks the storage bottleneck with the 1 IB/s "Blue Waters" system at the National Center for Supercomputing Applications.

### THEN

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

### 2000

### **NOW**

Today, genome sequencing more and larger sequencers can be produced quickly.

## 2012

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

**NOW** 

### **NOW**

2015

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.

costs are far lower and have triggered data explosion;

## TODAY

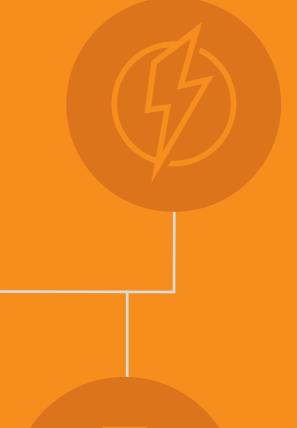
HPC enables:

- 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



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.

details of the cell. A human cell is about 10 micrometers long and we can simulate it at a

The future of HPC is exascale; exascale will set us on the path to chemically resolve

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



**HPC** 

cut corners or do nothing at all.

computing infrastructures to plan for

the future. It will be too costly to

Companies must update their

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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.

Next-gen storage will power a "learning system" that helps identify patterns and



**IMPACT** 

