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Bioinformatics Application Has a BLAST With Exanodes Shared Internal Storage

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As scientific research has become more sophisticated, the field of bioinformatics — where computer technology and biology meet — has become increasingly critical to our understanding of the natural world. Entire databases of biological data are created, indexed, organized, and analyzed, requiring sophisticated and robust tools. Bioinformatics often make use of mathematical computations, algorithms, artificial intelligence, modeling, and other complex applications.

The most widely used of these tools today is known as BLAST (Basic Local Alignment Search Tool). As the acronym suggests, BLAST is intended to be a high-speed application. BLAST finds statistically-probable similarities and patterns in data such as DNA sequences, proteins, or nucleotides. There's no question that BLAST has revolutionized the industry it serves, and there's also no question that all this analytical power requires high-performing processors.

The Challenge

BLAST requires greatly accelerated performance in order to keep pace with demanding search analyses. Just three years ago, a network file system (NFS) array was more than adequate to manage BLAST queries, but recent improvements in processor speeds, as well as a need for additional servers, means an NFS array is now an unavoidable, productivity-slashing bottleneck — one that becomes far more expensive and time-inten-

sive to manage as the bottlenecks persist and workarounds are sought.

Overburdened arrays can no longer serve data at the pace the central process unit (CPU) needs it. As a result, CPU rates are getting lower and lower and are now far from their optimal speed, and all resources, including humans, spend far more time waiting for data than analyzing and interpreting it.

Organizations with a limited technology acquisition budget but a strong internal commitment to solving problems are challenged to look beyond the typical answers to this severe decline in performance. After an in-depth evaluation of business needs, some companies have discovered a shared internal storage (SIS) approach, that makes use of unused disk space inside computing nodes, will overcome this challenge.

The Solution

The pioneers in SIS, Seanodes, is able to achieve a twofold increase in BLAST speeds thanks to its Exanodes™ software. Exanodes transforms the storage components inside computing servers into a high-end virtualized storage pool, enabling users to quickly identify and

take advantage of under-utilized internal storage capacity. With each node functioning as both a computing and storage server, the need and expense of buying and maintaining dedicated storage arrays is eliminated, thereby enabling full infrastructure consolidation.

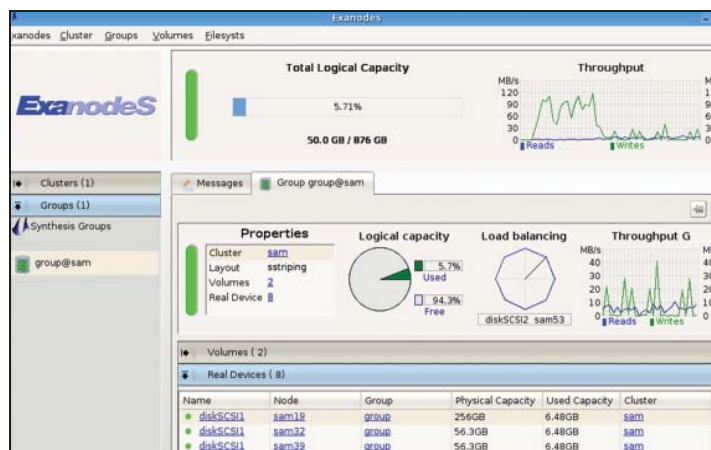
In addition to increasing BLAST query performance, users realize increased reliability as the NFS server is no longer a single point of failure. The simplicity of the Exanodes model reduces management time and complexity, and physical installation takes less than two hours.

Just as the field of bioinformatics is changing our understanding of grand biological questions like the human genome, shared internal storage is changing the way we look at network storage technology because the SIS platform radically alters the economics and possibilities in data storage and application processing.

When we compare return-on-investment figures for Seanodes' Exanodes versus additional servers and the gains realized by the SIS model, Exanodes is an investment that is between seven and ten times more profitable. Exanodes can allow end-users to cancel their storage and server investment for one year, as they are able to do twice the work without adding any components in the infrastructure.

In these times of budget restrictions, this technology allows IT directors to keep pace with growing business needs while keeping their CFOs happy.

Exanodes™ is a trademark of Seanodes.



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