

A complete hardware and software solution for high-throughput protein identification



IBM and Matrix Science deliver affordable turnkey package for high-throughput protein identification



As proteomic research matures, it continues to generate mountains of data—increasing the demand for search engines that can rapidly and accurately identify peptides and proteins linked to specific disease types. Since search procedures are computationally intensive and require the ability to perform complex statistical calculations while streaming through large sequence databases, they must be supported by robust, high-performance systems capable of handling such high-throughput applications.

Highly affordable high-throughput protein identification

With the understanding that both time and lab space are limited, Matrix Science, with IBM, offers life science organizations a complete, compact hardware and software package designed for efficient, cost-effective protein identification. This combined solution accepts mass spectrometry data from all leading manufacturers, enabling researchers to save considerable time and effort. It includes Mascot[®], a Matrix Science software suite for protein identification

IBM Business Partner:

Matrix Science Ltd.

Matrix Science develops and markets software products that integrate mass spectrometry into bioinformatics. Mass spectrometry has become the method of choice for protein identification and characterization, analyzing large numbers of samples at high speed. Matrix Science has distribution agreements with several leading mass spectrometer manufacturers, and Mascot, its flagship product, has been licensed by nine out of the ten largest pharmaceutical companies. Matrix Science is headquartered in London, England and has offices in North America and Japan.

MATRIX
SCIENCE

that matches mass spectrometry data to protein or nucleic acid sequence databases, and an IBM @server® BladeCenter™, a cluster of modular, high-performance blade servers. Blade servers are independent servers that fit in a single chassis, but each one is equipped with its own processors, memory, storage, network controllers, operating system and applications. The blade server simply slides into a bay in the chassis and plugs into a mid- or backplane, sharing power, fans, floppy drives, switches and ports with other blade servers.

Integrated into a single, turnkey package, Mascot Cluster is not only easy to implement, but easy to extend, so scientists can support mass spectrometers from various leading manufacturers.

Mascot Cluster is an affordable solution that runs on Microsoft® Windows® or Red Hat® Linux operating systems, making it an ideal entry-level system. IBM and Matrix Science have also optimized the Mascot Server for the

IBM @server pSeries® system, running IBM AIX® 5L™ and providing an open, standards-based UNIX® operating environment. The IBM @server Cluster 1350 also offers superior performance by combining the power of the IBM @server BladeCenter and IBM @server xSeries® with IBM Cluster Systems Management for Linux software. The benefits of IBM @server cluster systems include 24 x 7 availability with failover protection, the ability to handle unexpected peaks in workload, central system management and disaster recovery.

Matrix Science and IBM have performed benchmarks across the IBM @server product line, including

IBM @server BladeCenter, IBM @server cluster and IBM @server pSeries. The results of the studies indicate that Mascot scales linearly with the number of processors offered by each of the IBM products. Therefore, users can choose the platform optimized for their specific requirements.

Supporting multiple mass spectrometers

Mascot is a powerful search engine that uses mass spectrometry data to identify proteins from primary sequence databases. It is currently licensed for in-house use by hundreds of academic and commercial researchers, including nine of the world's ten largest pharmaceutical companies. Benefits like these have

“Matrix Science is delighted to be able to offer a turnkey solution running on the IBM BladeCenter cluster. The BladeCenter is unique in offering the fastest possible performance packed into a small space with renowned IBM reliability and support.”

– David Creasy, Technical Director, Matrix Science

helped Mascot set the standard for protein identification using mass spec data. Mascot Cluster:

- *Supports peptide mass fingerprint, sequence query and MS/MS Ion search strategies in a single, integrated package*
- *Offers true probability-based scoring, allowing for the application of standard statistical tests and for automated acceptance/rejection of results*
- *Accepts mass spectrometry data from all the leading instrument manufacturers*
- *Uses fast, threaded code to help deliver high throughput on a wide range of single and multi-processor systems and clusters*
- *Supports search on any FASTA database, including protein, EST or genomic DNA*
- *Includes Web browser-based administration tools for remote monitoring and control*
- *Provides rack-mounted support for up to 24 processors for near-perfect scaling*

Performance and manageability

IBM @server BladeCenter solutions support life sciences applications with virtually unsurpassed performance, manageability and resiliency in a blade architecture. At twice the density of today's 1U servers, IBM @server BladeCenter contributes to a highly managed infrastructure that helps maximize resource productivity and minimize IT administration costs.

The IBM hardware optimized for Mascot Cluster is the 19" rack-mountable IBM @server BladeCenter, which supports up to 28 Intel® processors. The chassis incorporates redundant power supplies, and individual dual processor nodes are hot-swappable.

Mascot Server is regularly updated as new functionality is added, and each update is provided on a CD-ROM for installation on the master blade. All Mascot software components and sequence databases are distributed, updated and configured automatically from the master node.

Unique functionality, unsurpassed support and commitment

Mascot Cluster is shipped fully configured and tested to facilitate optimal performance and fast time-to-value.

BladeCenter hardware is covered by a three-year, on-site, limited warranty for parts and labor, provided by IBM Global Services. Mascot Server software is covered by a one-year warranty, providing access to expert technical support and free updates to all new releases of Mascot.

Unique in its ability to support data from a range of mass spec instrument manufacturers, Mascot Cluster is a comprehensive, scalable protein identification system from two industry leaders. Both Matrix Science and IBM are dedicated to supporting life sciences organizations with effective, intelligent, affordable solutions that can accelerate the identification of proteins—and the pace of discovery research.

About IBM

The goal of IBM Life Sciences is to rapidly bring IT technology to customers and IBM Business Partners in the fields of pharmaceutical research, biotechnology, genomics, health and other life science industries. IBM is a proven leader in data integration, supercomputing, high performance storage, e-business and information technology services.

Long-term projects at IBM Research Centers and the IBM Deep Computing Institute foster collaboration with life sciences companies—bringing domain expertise and innovative technologies to the development of life sciences solutions. IBM actively collaborates with companies like Matrix Science, whose domain knowledge, products and resources can help build valuable solutions for our mutual customers.

For more information

To learn more about IBM Life Science Solutions and our Business Partners, visit ibm.com/industries/lifesciences or contact an IBM Life Sciences specialist at LS@us.ibm.com.

To learn more about Matrix Science, visit www.matrixscience.com.



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