SGI® BioCluster

With the SGI® BioCluster, researchers now can harness the full potential of Linux® clusters powered by today's most advanced multi-core processors. The SGI BioCluster is an SGI® Altix® XE system bundled with software that simplifies cluster management and maximizes throughput. This turnkey solution accelerates genomics and proteomics workflows while easily integrating into existing IT infrastructures.

Purpose-built for pharmaceutical, life sciences and higher education researchers, the SGI BioCluster integrates the scalable SGI Altix XE platform, multi-core Intel® Xeon® processors and Scali Manage.

To achieve dramatic increases in throughput, the SGI BioCluster also incorporates eXludus Grid Optimizer™, a new multi-core capacity management technology designed to increase the throughput efficiency of multi-core processors. Grid Optimizer prevents your cluster's processors from interfering with one another, so BioSciences applications can take full advantage of the scalable SGI Altix XE architecture.

Take advantage of a true high-throughput cluster:
- Achieve optimal throughput even when running workloads with tens, hundreds or thousands of concurrent users, with Grid Optimizer's unique real-time job schedule optimization technology
- Leverage Grid Optimizer to dynamically allocate the right amount of resources for each application as workflow demands change
- Speed time-to-results on leading BioSciences applications – boost HMMER performance by 70 percent and BLAST-n queries by 90 percent (compared to an Altix XE cluster running PBS Pro only)
- Realize breakthrough performance while minimizing operating costs with the SGI Altix XE platform's efficient power utilization and advanced system cooling features
- Right-size your SGI BioCluster with dozens or hundreds of processor cores featuring the advanced Intel® Dual-Core and Quad-Core Xeon® Processor architecture
- Simplify deployment with a factory integrated and tested solution delivered with a complete cluster management software stack and backed by Customer Support.
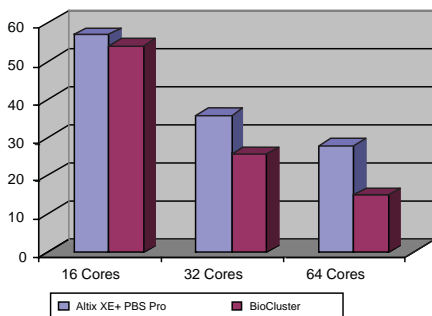
Call today to learn how the SGI BioCluster can help you turbocharge your research workflow.Please call 1-800-800-SGI1 (7441), e-mail at eleads@sgi.com, or contact your authorized SGI channel partner.
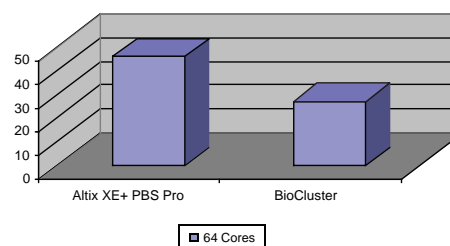
SGI® BioCluster

	SGI® Altix® XE250	SGI® Altix® XE310	SGI® Altix® XE320
Node Type	Head or compute	Compute (2 nodes per XE310)	Compute (2 nodes per XE320)
Processors	Up to two Dual or Quad-Core Intel® Xeon® Processors, 5200 or 5400 Series • Front Side Bus: 1600 or 1333 MHz • L2 Cache: 6MB for 5200 series, 12MB for 5400 series	Up to four Quad-Core Intel® Xeon® Processors, 5400 Series (2 per node) • Front Side Bus: 1333 MHz • L2 Cache: 12MB	Up to four Dual or Quad-Core Intel® Xeon® Processors, 5100, 5200, 5300 or 5400 series (2 per node) • Front Side Bus: 1600 or 1333 MHz • L2 Cache: 6MB for 5200 series, 12MB for 5400 series
Memory	64 GB DDR2 800 or 667 MHz FBDIMM memory Supports memory sparing and mirroring	64 GB DDR2 800 or 667 MHz FBDIMM memory (32GB per node) Supports memory sparing and mirroring	
PCI Slots	2 x PCIe x8 gen 2/ 1 x PCIe x8 gen 1 1 x PCIe x4 gen 1/ 1 x PCI-x 133/100	2 x PCIe x8 (1 per node)	2 x PCIe x16 (1 per node)
Integrated I/O	• 2 x Gigabit Ethernet • 2 x COM port • 2 x VGA ports • 4 x USB ports • 2 x PS/2 ports	• 2 x InfiniBand port (1 per node), optional • 2 x COM port (1 per node) • 2 x VGA (1 per node) • 4 x Gigabit Ethernet (2 per node) • 4 x USB ports (2 per node) • 2 x 4 mini SAS ports (1 per node) with SAS/RAID option	
Internal Storage	Eight SATA/SAS drive bays • 3.5" SATA drive - 250GB, 500GB, 750GB • 3.5" SAS drive - 73GB, 143GB, 300GB • 1 x DVD-RW drive RAID 0, 1, 5, or 10	Four SATA drive bays (2 per node) • 3.5" SATA drive – 250GB, 500GB, 750GB Four SAS drives available via optional PCIe card (2 per node) • 3.5" SAS drive – 73GB, 143GB, 300GB Optional RAID 0, 1	
System Software	• Red Hat® Enterprise Linux® 4.5 and 5.0 • SUSE® Linux® Enterprise Server 10 • SGI ProPack™ 5 for Linux®		
SGI® BioCluster Software Solution Stack	• Capacity Management Software: eXludus Grid Optimizer™ • Cluster Management Software: Scali Manage • Job Scheduling/ Workload Management: Altair® PBS Professional™ • Fabric Management: SGI InfiniBand Fabric Management (based on OFED) or Voltaire GridStack (on SLES 9 systems) • Filesystem: XFS™ 64-bit journaled filesystem (available on SUSE Linux OS), CXFS™ shared filesystem for SANs • Network File System: Samba, NFS		
Development Tools	• Programming Languages: Intel C++ Compiler, GNU GCC, Intel Fortran Compiler (Fortran95), GNU GNAT, AdaCore GNAT Pro, Java2 1.4.2, BEA JRockit • Debuggers: Intel Debugger (idb) included w/Intel compilers, GNU gdb, Etnus TotalView, Allinea DDT, Intel Thread Checker • Libraries: Intel Math Kernel Library, Intel Math Kernel Library Cluster Edition, Intel Integrated Performance Primitives, Intel Threading Building Blocks • Parallel Programming: Intel MPI, Voltaire MPI in Voltaire IBHost and Voltaire GridStack, OpenMP included w/Intel compilers, Intel Cluster OpenMP, Intel Trace Analyzer and Collector, Allinea DDT • Performance Analysis: Intel VTune Performance Analyzer, Intel Trace Analyzer & Collector		
Support and Services	SGI provides support for hardware and systems software. SGI also offers services to implement and integrate Linux applications in your environment. For more information, please see www.sgi.com/support.		

BLAST Acceleration on BioCluster

Legend: Altix XE+ PBS Pro, BioCluster (16 Cores, 32 Cores, 64 Cores)

The turnkey SGI BioCluster solution boosts application performance by up to 1.9X for Blast-n queries, compared to similarly configured Altix XE clusters running only PBS Pro.

HMMER Acceleration on BioCluster

Legend: Altix XE+ PBS Pro, BioCluster (64 Cores)

In tests of a 64-core SGI BioCluster, 10,000 HMMER queries against a Pfam database took just 27 minutes to complete, compared to 46 minutes on a similarly configured Altix XE cluster running only PBS Pro. The results show a speed-up of 1.7X.