

*Unsurpassed performance, ultrascale computing*

# IBM System Blue Gene Solution



The IBM® System Blue Gene® Solution is the result of an IBM project begun several years ago, dedicated to building a new family of supercomputers optimized for bandwidth, scalability and the ability to handle large amounts of data while consuming a fraction of the power and floor space required by today's fastest systems.

Blue Gene customers note that time-to-solution for many applications has been reduced by an order of magnitude. Scientists can make a new runs more often allowing them to explore alternative models and approaches to problems. Blue Gene is making a demonstrable change in the way science can be done.

Today Blue Gene ranks as the number one fastest supercomputer on the TOP500 list, and holds 19 of the top 100 positions. The world's fastest supercomputer is installed at the Department of Energy's/National Nuclear Security Administration's Lawrence Livermore National Laboratory.

And Blue Gene delivers more than ultrascale performance. Because of unique design points that allow dense packaging of processors, memory and interconnects, Blue Gene offers leadership efficiency in the areas of power and floor space consumption.

Many university and government research labs have also deployed Blue Gene for computational studies in weapons research, radio astronomy, protein folding, climate research, cosmology, and drug development.

Available in configurations ranging from one to 64 racks, Blue Gene is the innovative new solution from IBM that delivers an ultrascale solution without sacrificing efficiency.

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
## Highlights

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- ***Leadership performance in a space-saving, power-efficient package for the most demanding HPC applications***
- ***Design innovations to advance breakthrough science across an important set of vital workloads***
- ***Technology accessible to a wide range of scientists, researchers and developers***

Attribute	Details	Benefits
Processor	PowerPC 440 700MHz; two per node	Low power allows dense packaging; better processor-memory balance
Memory per node	512 MB SDRAM-DDR (Model 0203-700) 1 GB SDRAM-DDR (Model 0203-900)	
Networks	1) 3D Torus - 175MB/sec in each direction 2) Collective Network – 350MB/sec; 1.5 usec latency 3) Global Barrier/Interrupt 4) Gigabit Ethernet (I/O & connectivity) 5) Control (system boot, debug, monitoring)	Special networks speed up internode communications; designed for MPI programming constructs; improve systems management
Compute Nodes	Dual processor; 1024 per rack	Double FPU improves performance
I/O Nodes	Dual processor; 16-128 per rack	Facilitates job launch and I/O, raising efficiency of compute nodes
Operating Systems	Compute Node – Lightweight proprietary kernel I/O Node – Embedded Linux Front End and Service Nodes – SuSE SLES 9 Linux	Kernel tailored to processor design; industry-standard distribution on front-end and service nodes preserves familiarity to end users and administrators
Performance	Peak performance per rack – 5.73 TFlops Linpack performance per rack – 4.71 TFlops	Highest available performance benefits capability customers
Power	27.6 kW power consumption per rack (maximum) 7 kW power consumption per rack (idle) 208 VAC 3-phase; 100 amp service per rack	Low power draw enables dense packaging
Cooling	Air conditioning 8 tons/rack (minimum) 2800 CFM (compute rack); 350 CFM (power supplies)	Low cooling requirements enable extreme scale-up
Acoustics	9.0 LwAD and 8.7 LwAm	
Dimensions (includes air duct)	Height – 77” Width – 36” Depth – 36” Weight – 1810 lbs. Service clearances – 30” front and back Raised floor height – 16” minimum	Design allows dense floor plan layout for better floor space utilization

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