IBM unveils new supercomputer

June 13 2005

IBM announced today the launch of the world's most powerful privately-owned supercomputer, the Watson Blue Gene system, nicknamed BGW, installed at the IBM Thomas J. Watson Research Center in Yorktown Heights, N.Y.
With a processing speed of 91.29 teraflops, the system is expected to join its sister machine -- the Blue Gene/L supercomputer installed at Lawrence Livermore National Lab (LLNL) and currently the world's fastest – as one of the top three supercomputers in the world. BGW is comprised of 20 refrigerator-sized racks, less than 1/2 the size of conventional systems of comparable power and has 3 times the performance.

IBM plans to use the system to explore how BGW's unprecedented power might enable an extraordinary period of progress in a range of fields, from technical -- including life sciences, hydrodynamics, materials sciences, quantum chemistry, molecular dynamics and fluid dynamics -- to business applications.
"IBM researchers will use BGW to accelerate discovery in a variety of disciplines," said Tilak Agerwala, vice president, Systems, IBM Research. "Researchers, scientists, engineers and inventors can now ask more questions, test more theories, try more designs, and simulate more conditions than has been possible before."

One of the first applications to be deployed on BGW will be Blue Matter, the software framework developed as part of the science effort within the Blue Gene project at IBM Research. Initial results on Blue Matter, which is used to run protein dynamics simulations important to

drug development, were published in the Journal of the American Chemical Society in April 2005.

IBM also intends to provide access to BGW computing resources to academic and industrial researchers as part of the Department of Energy's Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program. The DOE recently expanded the INCITE program to offer selected outside parties access to the Blue Gene system at Argonne National Laboratories, and IBM will supplement access to that system with up to 5% of the cycles available on BGW. The program seeks computationally intensive, large-scale research projects and encourages proposals from universities, other research institutions and industry.

The Department of Energy's/National Nuclear Security Administration entered into a partnership with IBM in funding research and development of Blue Gene/L in 2000 in order to explore designs for highly cost-effective computers for science and mission. Since then, researchers from LLNL and its sister laboratory, Los Alamos National Laboratory, have collaborated closely with IBM both in the early stages of system design, and later through providing challenging workloads and technical insights, including performance analysis. BlueGene/L is poised to achieve an astonishing 360 peak Teraflops when a 64 rack system with over 130,000 IBM PowerPC® processors is completely installed in 2005 at the DOE's/NNSA's Lawrence Livermore National Laboratory (LLNL).

BGW will also be used by IBM's Center for Business Optimization (CBO) – a new consulting and software unit which taps IBM's math scientists, industry and deep computing expertise to tackle clients' previously unsolvable problems. The CBO plans to use BGW to develop and run advanced mathematical algorithms for a variety of client problems. For example, high-precision weather forecasting software will

feed predictive models for such diverse applications as disaster response, utility supply/demand forecasting, agricultural maintenance scheduling and transportation planning. In addition, BGW provides the power to track and analyze world financial markets in support of global risk measurement and management.

Blue Gene's combination of high performance with smaller size, cost and power consumption has brought supercomputing technology to the point where it can now be made more widely available and applied to a broader set of applications whereas the speed and performance of yesterday's supercomputers had limited value and accessibility due to their high cost and large size limiting their use to only a select few at national labs.