Roadrunner Smashes the Petaflop Barrier

Armonk, NY - 09 Jun 2008: In 2006, the Department of Energy's National Nuclear Security Administration selected Los Alamos National Laboratory as the development site for Roadrunner and IBM as the computer's designer and builder. Roadrunner, named after the New Mexico state bird, cost about $100 million, and was a three-phase project to deliver the world's first "hybrid" supercomputer – one powerful enough to operate at one petaflop (one thousand trillion calculations per second). That's twice as fast as the current No.1 rated IBM Blue Gene system at Lawrence Livermore National Lab – itself nearly three times faster than the leading contenders on the current TOP 500 list of worldwide supercomputers.

- Roadrunner will primarily be used to ensure the safety and reliability of the nation's nuclear weapons stockpile. It will also be used for research into astronomy, energy, human genome science and climate change.
- Roadrunner is the world's first hybrid supercomputer. In a first-of-a-kind design, the Cell Broadband Engine® -- originally designed for video game platforms such as the Sony Playstation 3® -- will work in conjunction with x86 processors from AMD®.
- The machine was built, tested and benchmarked in IBM's Poughkeepsie, N.Y. plant, home of the ASCI series of supercomputers the company built for the US government in the late 1990s. IBM's site in Rochester, Minn. constructed the specialized tri-blade servers. Software development was led by IBM engineers in Austin, Texas and by researchers in IBM's Yorktown Heights, N.Y. research lab. Roadrunner will be loaded onto 21 tractor trailer trucks later this summer when it is delivered to Los Alamos National Lab in New Mexico.
- Energy Miser. Compared to most traditional supercomputer designs, Roadrunner's hybrid format sips power (2.35 megawatts) and delivers world-leading efficiency – 437 million calculations per watt. IBM expects Roadrunner to place among the top energy-efficient systems later in June when the official "Green 500" list of supercomputers is issued.
- Applications for Cell-based hybrid supercomputing include: calculating cause and effect in capital markets in real-time, supercomputers in financial services can instantly predict the ripple effect of a stock market change throughout the markets. In medicine, complex 3-D renderings of tissues and bone structures will happen in real-time, as patients are being examined.
- **How fast is a petaflop?** Roadrunner operates at speeds exceeding one petaflop -- one thousand trillion calculations per second -- or one million billion calculations per second; or one quadrillion calculations per second.

- Lots of laptops. That's roughly equivalent to the combined computing power of 100,000 of today's fastest laptop computers. You would need a stack of laptops 1.5 miles high to equal Roadrunner's performance.
- It would take the entire population of the earth**,** -- about six billion – each of us working a handheld calculator at the rate of one second per calculation, more than 46 years to do what Roadrunner can do in one day.

Contact : **Michael Corrado,** IBM Media Relations, 914-766-4635, mcorrado@us.ibm.com