

nCUBE 2 parallel supercomputer installed at San Diego Supercomputer Center

October 24, 1990

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nCUBE PARALLEL SUPERCOMPUTER INSTALLED AT SAN DIEGO SUPERCOMPUTER CENTER

An nCUBE 2 parallel supercomputer has been installed at the San Diego Supercomputer Center (SDSC) as part of a two-year joint agreement between the center and nCUBE, based in Beaverton, Ore.

A supporting grant also has been obtained from the National Science Foundation (NSF) to help SDSC researchers develop software for the nCUBE 2, particularly in biological applications such as the human genome project.

The addition of the 256-node nCUBE 2, when combined with the recently acquired 32-node Intel iPSC/860 parallel supercomputer and the 8-processor CRAY Y-MP8/864, underscores the belief among SDSC officials in the future of parallel systems for solving complex scientific problems.

Parallel computers work by dividing a single computational task among its several processors (computational units).

"It's a recognition that the future of supercomputing is a parallel one," said Wayne Pfeiffer, deputy director of research at SDSC.

"The speed of a single processor is approaching its physical limits," he added. "In order to continue to sustain further improvements in speed, it's going to be necessary to have parallel processors joined together."

The center's nCUBE 2 has a peak speed of nearly 2000 mips (million instructions per second), or nearly 850 (MFLOPS) million floating point calculations per second. The nCUBE 2's scalability, which allows the addition of hundreds or even thousands more processors, can greatly increase processing speed.

With NSF funding, SDSC researchers will implement several biology software packages on the nCUBE 2. Some of these are expected to further the human genome project, which seeks to construct a detailed map of the estimated 50,000 to 100,00 genes in a human cell.

The architecture of the nCUBE 2 makes it particularly useful for comparing newly discovered genetic sequences with thousands of previously known sequences found in existing databanks. With the nCUBE 2, portions of the databank could be divided among 256 processors, with comparisons performed in each unit. Any matches would be returned to the host computer.

Such comparisons could offer researchers their first clues into the novelty of an unknown sequence and its possible biological function in the body.

"It's a kind of first assessment of what the DNA might be," said Dan Sulzbach, manager of user services at SDSC and a principal investigator of the NSF-funded effort in biological software.

Sulzbach added, "nCUBE is going to make the hardware available, and the genome project is going to produce the data. What we are going to do with this NSF grant is provide the software that people need to bring together the data and the nCUBE system will make this possible."

The two-year agreement with nCUBE can be renewed and expanded upon satisfactory completion of the work now in progress.

According to nCUBE President Stephen R. Colley, "Our alliance with the San Diego Supercomputer Center brings the power of nCUBE's system to a well-known community of users working on significant problems. With the availability of the nCUBE 2 supercomputer at the center, we hope to enable many of these users to reach breakthroughs in their work much more quickly than was previously possible.

"We are very excited to be working with SDSC and their community of users to make even more applications available for nCUBE systems," continued Colley. "SDSC is a highly respected member of the supercomputing community and is world-renowned for its advanced computing achievements."

SDSC is administered and operated by General Atomics at the University of California, San Diego (UCSD). SDSC was established in cooperation with the National Science Foundation in 1985 to provide an intellectual environment in support of leading edge computational science and engineering. Thus, while primarily aimed at academia, SDSC welcomes industrial participants. Education, training, consulting and collaborative research and development efforts are among SDSC's offerings, as well as its unique supercomputer resources.

(October 24, 1990)