Remarks for Special Issue on Supercomputer SX-9

In step with recent advances in IT technology, the domain of application of HPC (High Performance Computing) has also been expanding. In the natural sciences, industrial technology, and other fields that were early users of the power of super-computers, advances in numerical simulations have further extended the scope of their application while driving growing demand for higher computational perform-ance. HPC has gone beyond the realm of science and technology and can now be found contributing in a broad range of fields from powering financial simulations and web search engines to realizing advanced computer graphics and the visuali-zation of data.

Since our 1983 announcement of the SX-2 which was the first computer to ach-ieve 1GFLOPS, NEC has continued its pursuit of ultrahigh-speed class supercom-puters capable of highly advanced simulations. Compared with scalar-type computers that use general-purpose commodity CPUs, the SX series of vector su-percomputers is characterized by higher sustained performance realized by the high-performance computation units and extremely wide memory bandwidth to supply data in the quantities and at the speed to satisfy the computation units. Throughout the history of the SX series, the latest technology has always been incorporated to address a variety of operational cost issues related to aspects such as power consumption, required installation space and cooling. Over the history of the SX series, over 1,000 units have been sold to satisfied customers around the world and are making a valuable contribution to the advance of science and tech-nology and the vitality of business activities.

Announced in October 2007, SX-9 is the latest in this series of state-of-the-art supercomputers, realizing "world first" performance exceeding 100GFLOPS per single core, as well as the peak processing performance in the petaflops range with its largest configuration. This special issue introduces readers to the advanced hardware technology, the basic software that exploits maximum performance from this hardware and application case studies. Following an overall outline of the de-vice and an explanation of improvements in the architecture, this issue will provide a description of the core technologies (LSI design, high-density packaging, CAD, RAS, disks). In the section covering the software, the reader will be introduced to

the operating system, compilers and MPI library and high-speed/high-precision mathematical library. For our presentation of application case studies, we have received the generous contribution of articles on the latest research results from the Cyberscience Center of Tohoku University - a long-time user of the SX series, and the Central Research Institute of Electric Power Industry. On behalf of NEC, I would like to take this opportunity to express our deep gratitude for their cooperation.

In closing, I hope that all our readers will find our latest issue both fascinating and informative, and would like to express our sincere hopes for your continued support and encouragement.

ITO Yukio
Senior Vice President