Preface

November 12, 1995

The Aims

This report is a snapshot of the state of supercomputer installations in the world. It is based on the TOP500 list that was published in November 1995 and includes trends from the previous lists from June 1993 till November 1995.

Statistics on high-performance computers are of major interest to manufacturers, users, potential users, and decision makers in universities, government, and industry. These people wish to know not only the number of systems installed, but also the locations of the various supercomputers within the high-performance computing community, and the applications for which a computer system is used. Such statistics provide a better understanding of the high-performance market and can facilitate the exchange of data and software.

In the past, various system counts of the major vector computer manufacturers by continents and countries have been published. Such records have several limitations, however. The data was difficult to obtain, and often was not reliable. Most important, more extensive statistics (than simply a list of manufacturers' names) are now required because of the diversification of supercomputers, the enormous performance difference between low-end and high-end models, the increasing availability of massively parallel processing (MPP) systems, and the strong increase in computing power of the high-end models of workstation suppliers including symmetric multiprocessing (SMP) systems.

This report is meant as an interface between the TOP500 list and the reader who wishes more background information and explanation. Here various experts present detailed analyses of the TOP500 and discuss the changes that have occurred in the supercomputing market over the past year.

We plan to continue to update this report annually and to distribute it widely to the high-performance computing community. The first TOP500 Reports were published 1993 and 1994.

The Contents

This report consists of ten articles. The first five articles present a detailed analysis of the high-performance computing situation as of November 1994. The next four articles focus on the hardware and software of the systems, which can be seen in the TOP500 . The final article is a complete reprint of the November 1995 issues of the "TOP500 Supercomputer Sites," which provide the basis of this report.

Dongarra, Meuer and Strohmaier analyze in the first article the general worldwide trends, which are revealed by the six releases of the TOP500 published in the past three years. They present the changes over time with respect to geography, manufacturers, applications, architectures, and technology. Dongarra and Simon present an in-depth analysis of the U.S. situation of the field of high-performance computing. Hoffman and Schnepf give an overview of the Japanese installations and Japanese vendors and the differences to the overall market. Harms, Emmen and Llurba discuss the European situation and provide a brief summary on computing in the United Kingdom, France, Germany, and the Benelux nations. Bez, Emmen and Simon present a short description of the 25 centers with the highest accumulated performance installed. Van der Steen summarizes the new architectures of the different systems in the TOP500 giving a concise description for each architecture. Dongarra and Walker present an overview of the new MPI standard, which is at present the most promising attempts to create a standardized programming environement for parallel computers with distributed memory. Nagel et al. descibe in their article a new graphical interface for tracing, debugging and performance tuning for MPI. As a case study for Cluster computing Mierendorf, Schüller and Trottenberg present their results for running the IFS weather prediction model of the ECMWF on a cluster of four full blown C90s. For this work they were awarded the SuParCup'95 at the *Mannheim Supercomputer Seminar '95.*

The Audience

The report has been prepared for the high-performance computing community in general, and specifically for managers of supercomputer centers, users of supercomputers, computer/supercomputer manufacturers, consultants, professional market analysts, decision makers, politicians, Wall Street analysts, computer science people, and students.

Acknowledgments

Without the help of high-performance experts, computational scientists, manufacturers, and the Internet community, our TOP500—the basis of this report—could not have been compiled. We cordially thank all colleagues supporting us,

and we ask for their continued support in order to present future TOP500 lists and reports like the one presented here.

Mannheim / Tennessee, November 17, 1995

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