# TOP500 Supercomputer Sites

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[1] Dedicated to Dr. Hans-Martin Wacker in honour of his 60th birthday

# TOP500 Supercomputer Sites

*Jack J. Dongarra, Hans W. Meuer, and Erich Strohmaier*

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**Abstract**

To provide a better basis for statistics on high-performance computers, we list the sites that have the 500 most powerful computer systems installed. The best LINPACK benchmark performance achieved is used as a performance measure in ranking the computers.

## 1 Introduction and Objectives

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

Statistical lists of supercomputers are not new. Every year since 1986 Hans Meuer [1] has published system counts of the major vector computer manufacturers, based principally on those at the Mannheim Supercomputer Seminar. Statistics based merely on the name of the manufacturer are no longer useful, however. New statistics are required that reflect 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 (SMP).

To provide this new statistical foundation, we have decided in 1993 to assemble and maintain a list of the 500 most powerful computer systems. Our list has been compiled twice a year since June 1993 with the help of high-performance computer experts, computational scientists, manufacturers, and the Internet community in general who responded to a questionnaire we sent out; we thank all the contributors for their cooperation. We have also used parts of statistical lists published by others for different purposes [2].

In the present list (which we call the TOP500), we list computers ranked by their performance on the LINPACK Benchmark. While we make every attempt to verify the results obtained from users and vendors, errors are bound to exist and should be brought to our attention. We intend to continue to update this list half-yearly and, in this way, to keep track with the evolution of computers. Hence, we welcome any comments and information; please send electronic mail

to *top500@rz.uni-mannheim.de*. The list is freely available by anonymous ftp to ftp.uni-mannheim.de/top500/ or to www.netlib.org/benchmark/top500.ps. The interested reader can additionally create sublists out of the TOP500 database and can make statistics on his own by using the WWW interface at
http://parallel.rz.uni-mannheim.de/top500.html or
http://www.netlib.org/benchmark/top500.html.
Here you also have access to postscript versions of slides dealing with the interpretation of the present situation as well as with the evolution over time since we started this project.

## 2 The LINPACK Benchmark

As a yardstick of performance we are using the "best" performance as measured by the LINPACK Benchmark [3]. LINPACK was chosen because it is widely used and performance numbers are available for almost all relevant systems.

The LINPACK Benchmark was introduced by Jack Dongarra. A detailed description as well as a list of performance results on a wide variety of machines is available in postscript form from *netlib*. To retrieve a copy send electronic mail to *netlib@ornl.gov* and by typing the message *send performance from benchmark* or from any machine on the internet type:
*rcp anon@netlib2.cs.utk.edu:benchmark/performance performance*.

The benchmark used in the LINPACK Benchmark is to solve a dense system of linear equations. For the TOP500, we used that version of the benchmark that allows the user to scale the size of the problem and to optimize the software in order to achieve the best performance for a given machine. This performance does not reflect the *overall performance* of a given system, as no single number ever can. It does, however, reflect the *performance of a dedicated system for solving a dense system of linear equations.* Since the problem is very regular, the performance achieved is quite high, and the performance numbers give a good correction of peak performance.

By measuring the actual performance for different problem sizes $n$, a user can get not only the maximal achieved performance $R_{max}$ for the problem size $N_{max}$ but also the problem size $N_{1/2}$ where half of the performance $R_{max}$ is achieved. These numbers together with the theoretical peak performance $R_{peak}$ are the numbers given in the TOP500. If in the future a more realistic metric finds widespread usage, so that numbers for all systems in question are available, we may convert to that performance measure.

# 3 The TOP500 List

Table 1 shows the 500 most powerful commercially available computer systems known to us. To keep the list as compact as possible, we show only a part of our information here:

| | |
|---|---|
| • $N_{world}$ | Position within the TOP500 ranking |
| • Manufacturer | Manufacturer or vendor |
| • Computer | Type indicated by manufacturer or vendor |
| • Installation Site | Customer |
| • Location | Location and country |
| • Year | Year of installation/last major update |
| • Field of Application | |
| • # Proc. | Number of processors[2] |
| • $R_{max}$ | Maximal LINPACK performance achieved |
| • $R_{peak}$ | Theoretical peak performance |
| • $N_{max}$ | Problemsize for achieving $R_{max}$ |
| • $N_{1/2}$ | Problemsize for achieving half of $R_{max}$ |

If $R_{max}$ from Table 3 of the LINPACK Report [3] is not available, we use the TPP performance given in Table 1 [3] for solving a system of 1000 equations. In a few cases we interpolated between two measured system sizes or we scaled by cycle times. For models where we did not receive the requested data, the performance of the next smaller system measured is used.

If there should be any changes in the performances given in Table 1 we will update them.

In Table 1, the computers are ordered first by their $R_{max}$ value. In the case of equal performances ($R_{max}$ value) for different computers, we have chosen to order by $R_{peak}$. For sites that have the same computer, the order is by memory size and then alphabetically.

## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | **Rmax**<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 1 | Fujitsu<br>Numerical Wind Tunnel | NAL<br>Japan /1993 | Research<br>Aerospace | 140 | **170400**<br>236000 | 42000<br>13800 |
| 2 | Intel<br>XP/S140 | Sandia National Labs<br>Albuquerque USA /1993 | Research | 3680 | **143400**<br>184000 | 55700<br>20500 |
| 3 | Intel<br>XP/S-MP 150 | Oak Ridge National Laboratory<br>Oak Ridge USA /1995 | Research | 3072 | **127100**<br>154000 | 86000<br>17800 |
| 4 | Cray<br>T3D MC1024-8 | Government<br>USA /1994 | Classified | 1024 | **100500**<br>152000 | 81920<br>10224 |
| 5 | Fujitsu<br>VPP500/80 | National Lab. for High Energy Physics<br>Japan /1994 | Research | 80 | **98900**<br>128000 | 32640<br>10050 |
| 6 | IBM<br>SP2/512 | Cornell Theory Center<br>Ithaca USA /1994 | Academic | 512 | **88400**<br>136000 | 73500<br>20150 |
| 7 | IBM<br>SP2/512 | IBM/Poughkeepsie<br>Poughkeepsie USA /1995 | Vendor | 512 | **88400**<br>136000 | 73500<br>20150 |
| 8 | IBM<br>SP2/384 | Maui High-Performance Computing Center (MHPCC)<br>USA /1994 | Research | 384 | **66300**<br>102400 | .<br>. |
| 9 | NEC<br>SX-4/32 | NEC<br>Tokyo Japan /1995 | Vendor<br>Benchmarking | 32 | **60720**<br>64000 | .<br>. |
| 10 | TMC<br>CM-5/1056 | Los Alamos National Laboratory<br>Los Alamos USA /1993 | Research<br>Energy | 1056 | **59700**<br>135100 | 52224<br>24064 |
| 11 | Fujitsu<br>VPP500/42 | Japan Atomic Energy Research<br>Japan /1994 | Research | 42 | **54500**<br>67200 | .<br>. |
| 12 | Fujitsu<br>VPP500/42 | Nagoya University<br>Nagoya Japan /1995 | Academic | 42 | **54500**<br>67200 | .<br>. |
| 13 | TMC<br>CM-5/896 | Minnesota Supercomputer Center<br>USA /1994 | Academic | 896 | **52300**<br>114700 | .<br>. |
| 14 | Fujitsu<br>VPP500/40 | National Genetics Research Lab.<br>Japan /1995 | Research | 40 | **52070**<br>64000 | .<br>. |
| 15 | Fujitsu<br>VPP500/40 | Tokyo University - Inst. of Solid State Physics<br>Tokyo Japan /1994 | Academic | 40 | **52070**<br>64000 | .<br>. |
| 16 | Cray<br>T3D MC512-8 | Los Alamos National Laboratory<br>Los Alamos USA /1994 | Research<br>Energy | 512 | **50800**<br>76000 | 57856<br>7136 |
| 17 | Cray<br>T3D MC512-8 | Minnesota Supercomputer Center<br>USA /1995 | Academic | 512 | **50800**<br>76000 | 57856<br>7136 |
| 18 | Cray<br>T3D MC512-8 | Pittsburgh Supercomputing Center<br>Pittsburgh USA /1994 | Academic | 512 | **50800**<br>76000 | 57856<br>7136 |
| 19 | Fujitsu<br>VPP500/32 | The Angstrom Technology Partnership<br>Tsukuba Japan /1993 | Research | 32 | **42400**<br>51200 | 20736<br>4940 |
| 20 | Fujitsu<br>VPP500/30 | Tsukuba University<br>Tsukuba Japan /1993 | Research | 30 | **39812**<br>48000 | .<br>. |



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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 21 | Fujitsu VPP500/28 | Institute of Physical and Chemical Res. (RIKEN) Tokyo Japan /1993 | Research | 28 | **37225** 44800 | . . |
| 22 | Intel XP/S-MP 41 | Rome Laboratory USA /1995 | Research | 816 | **33700** 40800 | . . |
| 23 | Cray T3D MC320-8 | University of Edinburgh Edinburgh UK /1995 | Academic | 320 | **31700** 47600 | . . |
| 24 | TMC CM-5/512 | NCSA Urbana-Champaign USA /1993 | Academic | 512 | **30400** 66000 | 36864 16384 |
| 25 | TMC CM-5/512 | National Security Agency USA /1993 | Classified | 512 | **30400** 66000 | 36864 16384 |
| 26 | IBM SP2/160 | NASA/Ames Research Center/NAS Moffett Field USA /1994 | Research | 160 | **28700** 42500 | 42200 10300 |
| 27 | Hitachi S-3800/480 | Hitachi Ltd. GPCD Japan /1994 | Vendor Software | 4 | **28400** 32000 | 15500 830 |
| 28 | Hitachi S-3800/480 | Meteorological Agency Japan /1995 | Research Weather | 4 | **28400** 32000 | 15500 830 |
| 29 | Hitachi S-3800/480 | University of Tokyo Tokyo Japan /1993 | Academic | 4 | **28400** 32000 | 15500 830 |
| 30 | SGI POWER CHALLENGEarray | Silicon Graphics Mountain View USA /1995 | Vendor Benchmarking | 128 | **26653** 46080 | 53000 20000 |
| 31 | Cray T3D SC256-8/264 | Caltech/JPL Pasadena USA /1994 | Academic | 256 | **25300** 38000 | 40960 4918 |
| 32 | Cray T3D MC256-8 | Cray Research Eagan USA /1994 | Vendor | 256 | **25300** 38000 | 40960 4918 |
| 33 | Cray T3D MC256-8 | Defense Research Agency Farnborough UK /1994 | Classified | 256 | **25300** 38000 | 40960 4918 |
| 34 | Cray T3D MC256-8 | EXXON USA /1995 | Industry Geophysics | 256 | **25300** 38000 | 40960 4918 |
| 35 | Cray T3D MC256-8 | Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1994 | Academic | 256 | **25300** 38000 | 40960 4918 |
| 36 | Cray T3D SC256-8/364 | Lawrence Livermore National Laboratory Livermore USA /1994 | Research Energy | 256 | **25300** 38000 | 40960 4918 |
| 37 | Cray T3D SC256-8/464 | Los Alamos National Laboratory Los Alamos USA /1994 | Research Energy | 256 | **25300** 38000 | 40960 4918 |
| 38 | Cray T3D SC256-8/464 | ZIB/Konrad Zuse-Zentrum fuer Informationstechnik Berlin Germany /1995 | Academic | 256 | **25300** 38000 | 40960 4918 |
| 39 | NEC SX-3/44R | Atmospheric Environment Service (AES) Dorval Canada /1994 | Research Weather | 4 | **23200** 26000 | 6400 830 |
| 40 | NEC SX-3/44R | NEC Tokyo Japan /1990 | Vendor | 4 | **23200** 26000 | 6400 830 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | **$R_{max}$**<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 41 | NEC<br>SX-3/44R | Tohoku University<br>Tohoku Japan /1993 | Academic | 4 | **23200**<br>26000 | 6400<br>830 |
| 42 | Hitachi<br>S-3800/380 | Hokkaido University<br>Sapporo Japan /1994 | Academic | 3 | **21600**<br>24000 | 15680<br>760 |
| 43 | Hitachi<br>S-3800/380 | Institute for Materials Research/Tohoku University<br>Japan /1994 | Academic | 3 | **21600**<br>24000 | 15680<br>760 |
| 44 | Fujitsu<br>VPP500/15 | Kyoto University<br>Kyoto Japan /1994 | Academic | 15 | **20360**<br>24000 | .<br>. |
| 45 | NEC<br>SX-3/44 | Atmospheric Environment Service (AES)<br>Dorval Canada /1991 | Research<br>Weather | 4 | **20000**<br>22000 | 6144<br>832 |
| 46 | Intel<br>XP/S-MP 22 | ETH<br>Zuerich Switzerland /1995 | Academic | 450 | **18700**<br>22500 | .<br>. |
| 47 | IBM<br>SP2/104 | MCI<br>USA /1994 | Industry | 104 | **18590**<br>27700 | .<br>. |
| 48 | SGI<br>POWER CHALLENGEarray | US Army Research Laboratory<br>Aberdeen USA /1995 | Research | 96 | **18455**<br>28800 | 53000<br>20000 |
| 49 | NEC<br>SX-3/34R | National Inst. for Molecular Science<br>Okozaki Japan /1993 | Research | 3 | **17400**<br>19500 | 6144<br>691 |
| 50 | SGI<br>POWER CHALLENGEarray | Silicon Graphics<br>Cortaillod Switzerland /1995 | Vendor<br>Benchmarking | 64 | **15598**<br>23040 | 37000<br>8500 |
| 51 | SGI<br>POWER CHALLENGEarray | Silicon Graphics<br>Mountain View USA /1995 | Vendor<br>Software | 64 | **15598**<br>23040 | 37000<br>8500 |
| 52 | NEC<br>SX-4/8 | Atmospheric Environment Service (AES)<br>Dorval Canada /1995 | Research<br>Weather | 8 | **15470**<br>16000 | .<br>. |
| 53 | Intel<br>XP/S35 | Caltech<br>Pasadena USA /1994 | Research | 512 | **15200**<br>25600 | 23000<br>9000 |
| 54 | Intel<br>XP/S35 | Oak Ridge National Laboratory<br>Oak Ridge USA /1992 | Research | 512 | **15200**<br>25600 | 23000<br>9000 |
| 55 | IBM<br>sp2/85 | NIH (National Institute of Health)<br>Frederick USA /1995 | Research | 85 | **15190**<br>22660 | .<br>. |
| 56 | TMC<br>CM-5/256 | GECO-PRAKLA<br>Houston USA /1994 | Industry<br>Geophysics | 256 | **15100**<br>33000 | 26112<br>12032 |
| 57 | TMC<br>CM-5/256 | Government<br>USA /1993 | Classified | 256 | **15100**<br>33000 | 26112<br>12032 |
| 58 | TMC<br>CM-5/256 | US Naval Research Laboratory<br>Washington D.C. USA /1992 | Research | 256 | **15100**<br>33000 | 26112<br>12032 |
| 59 | Intel<br>Delta | Caltech<br>Pasadena USA /1991 | Academic | 512 | **13900**<br>20480 | 25000<br>7500 |
| 60 | Cray<br>Y-MP C916/16256 | Cray Research<br>Chippewa Falls USA /1992 | Vendor | 16 | **13700**<br>15238 | 10000<br>650 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **$R_{max}$** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 61 | Cray Y-MP C916/16512 | Cray Research Eagan USA /1992 | Vendor | 16 | **13700** 15238 | 10000 650 |
| 62 | Cray Y-MP C916/16256 | DKRZ Hamburg Germany /1995 | Research Weather | 16 | **13700** 15238 | 10000 650 |
| 63 | Cray Y-MP C916/161024 | DOD/CEWES Vicksburg USA /1994 | Research Mechanics | 16 | **13700** 15238 | 10000 650 |
| 64 | Cray Y-MP C916/16256 | DOE/Bettis Atomic Power Laboratory USA /1993 | Research | 16 | **13700** 15238 | 10000 650 |
| 65 | Cray Y-MP C916/16256 | DOE/Knolls Atomic Power Laboratory USA /1993 | Research | 16 | **13700** 15238 | 10000 650 |
| 66 | Cray Y-MP C916/16512 | DOE/National Security Agency USA /1994 | Classified | 16 | **13700** 15238 | 10000 650 |
| 67 | Cray Y-MP C916/16256 | ECMWF Reading UK /1994 | Research Weather | 16 | **13700** 15238 | 10000 650 |
| 68 | Cray Y-MP C916/16512 | Ford Motor Company Dearborn USA /1993 | Industry Automotive | 16 | **13700** 15238 | 10000 650 |
| 69 | Cray Y-MP C916/16512 | Ford Motor Company Dearborn USA /1995 | Industry Automotive | 16 | **13700** 15238 | 10000 650 |
| 70 | Cray Y-MP C916/161024 | Government USA /1992 | Classified | 16 | **13700** 15238 | 10000 650 |
| 71 | Cray Y-MP C916/161024 | Government USA /1992 | Classified | 16 | **13700** 15238 | 10000 650 |
| 72 | Cray Y-MP C916/161024 | Government USA /1992 | Classified | 16 | **13700** 15238 | 10000 650 |
| 73 | Cray Y-MP C916/161024 | Government USA /1992 | Classified | 16 | **13700** 15238 | 10000 650 |
| 74 | Cray Y-MP C916/16512 | Government USA /1994 | Classified | 16 | **13700** 15238 | 10000 650 |
| 75 | Cray Y-MP C916/16256 | Government Communications Headquarters Benhall UK /1994 | Classified | 16 | **13700** 15238 | 10000 650 |
| 76 | Cray Y-MP C916/16512 | KIST/System Engineering Research Institute Korea /1993 | Academic | 16 | **13700** 15238 | 10000 650 |
| 77 | Cray Y-MP C916/16256 | Lawrence Livermore National Laboratory Livermore USA /1992 | Research Energy | 16 | **13700** 15238 | 10000 650 |
| 78 | Cray Y-MP C916/161024 | NASA/Ames Research Center/NAS Moffett Field USA /1993 | Research | 16 | **13700** 15238 | 10000 650 |
| 79 | Cray Y-MP C916/16256 | NOAA Suitland USA /1994 | Research Weather | 16 | **13700** 15238 | 10000 650 |
| 80 | Cray Y-MP C916/16256 | NOAA/GFDL USA /1995 | Research Weather | 16 | **13700** 15238 | 10000 650 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **$R_{max}$** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 81 | Cray Y-MP C916/16512 | Pittsburgh Supercomputing Center Pittsburgh USA /1994 | Academic | 16 | **13700** 15238 | 10000 650 |
| 82 | Cray Y-MP C916/16256 | Res. Inf. Processing System (RIPS) Tsukuba Japan /1994 | Research | 16 | **13700** 15238 | 10000 650 |
| 83 | Cray Y-MP C916/161024 | Tohoku University, Institute of Fluid Science Aramaki Japan /1994 | Academic | 16 | **13700** 15238 | 10000 650 |
| 84 | Cray Y-MP C916/161024 | US Naval Oceanographic Command Bay Saint Louis USA /1994 | Research Weather | 16 | **13700** 15238 | 10000 650 |
| 85 | Cray Y-MP C916/16256 | United Kingdom Meteorological Office Bracknell UK /1994 | Research Weather | 16 | **13700** 15238 | 10000 650 |
| 86 | Fujitsu VPP500/10 | Communications Res. Lab. (CRL) Tokyo Japan /1993 | Research | 10 | **13675** 16000 | . . |
| 87 | IBM SP2/76 | SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1995 | Research | 76 | **13580** 20260 | . . |
| 88 | IBM SP2/72 | Nuclear Power Engineering Japan /1995 | Industry Energy | 72 | **12870** 19200 | . . |
| 89 | Cray T3D MC128-8 | Air Force/Eglin Air Force Base Eglin USA /1994 | Classified | 128 | **12800** 19000 | 20736 3408 |
| 90 | Cray T3D MC128-8 | CEA/Centre d'Etudes Limeil-Valenton France /1993 | Research | 128 | **12800** 19000 | 20736 3408 |
| 91 | Cray T3D MCA128-8 | CEA/Centre d'Etudes Nucleaires Grenoble France /1994 | Research Energy | 128 | **12800** 19000 | 20736 3408 |
| 92 | Cray T3D MC128-8 | Cray Research Eagan USA /1995 | Vendor | 128 | **12800** 19000 | 20736 3408 |
| 93 | Cray T3D MCA128-8 | ECMWF Reading UK /1994 | Research Weather | 128 | **12800** 19000 | 20736 3408 |
| 94 | Cray T3D MCA128-8 | Environmental Protection Agency USA /1995 | Research | 128 | **12800** 19000 | 20736 3408 |
| 95 | Cray T3D MCA128-8 | Max-Planck-Gesellschaft MPI Munchen Germany /1995 | Research | 128 | **12800** 19000 | 20736 3408 |
| 96 | Cray T3D MC128-8 | Phillips Petroleum Company Bartlesville USA /1994 | Industry Geophysics | 128 | **12800** 19000 | 20736 3408 |
| 97 | Cray T3D MCA128-2 | Reactor Nuclear Fuel Development Japan /1994 | Research | 128 | **12800** 19000 | 20736 3408 |
| 98 | Cray T3D MCA128-8 | Tohoku University, Institute of Fluid Science Aramaki Japan /1994 | Academic | 128 | **12800** 19000 | 20736 3408 |
| 99 | Cray T3D MC128-8 | University of Alaska - ARSC Fairbanks USA /1995 | Academic | 128 | **12800** 19000 | 20736 3408 |
| 100 | IBM SP2/70 | Leibniz Rechenzentrum Muenchen Germany /1995 | Academic | 70 | **12510** 18620 | . . |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 101 | Intel XP/S-MP 15 | ONERA Chatillon France /1995 | Research Aerospace | 294 | **12250** 14700 | . . |
| 102 | Intel XP/S-MP 14 | Oak Ridge National Laboratory Oak Ridge USA /1995 | Research | 288 | **12000** 14400 | . . |
| 103 | Intel XP/S30 | UCSD/San Diego Supercomputer Center San Diego USA /1993 | Academic | 400 | **11900** 20000 | . . |
| 104 | IBM SP2/65 | CERN Geneva Switzerland /1995 | Research | 65 | **11620** 17330 | . . |
| 105 | NEC SX-3/24R | German Aerospace Laboratory (DLR) Goettingen Germany /1994 | Research Aerospace | 2 | **11600** 13000 | 4352 516 |
| 106 | NEC SX-3/24R | National Institute of Fusion Science (NIFS) Japan /1993 | Research | 2 | **11600** 13000 | 4352 516 |
| 107 | NEC SX-3/24R | Swiss Scientific Computing Center (CSCS) Manno Switzerland /1994 | Research | 2 | **11600** 13000 | 4352 516 |
| 108 | NEC SX-3/24R | VW (Volkswagen AG) Wolfsburg Germany /1995 | Industry Automotive | 2 | **11600** 13000 | 4352 516 |
| 109 | TMC CM-5/192 | GECO-PRAKLA Houston USA /1995 | Industry Geophysics | 192 | **11400** 24600 | . . |
| 110 | IBM SP2/64 | Maui High-Performance Computing Center (MHPCC) USA /1994 | Research | 64 | **11400** 17000 | 26500 6250 |
| 111 | Fujitsu VPP500/8 | Fujitsu Ltd. Numazu Japan /1993 | Vendor | 8 | **11000** 12800 | 10368 2025 |
| 112 | IBM SP2/60 | DLR Koeln Germany /1995 | Research | 60 | **10730** 16000 | . . |
| 113 | IBM SP2/60 | Tokyo Metropolitan University Tokyo Japan /1995 | Academic | 60 | **10730** 16000 | . . |
| 114 | IBM SP2/59 | Pennsylvania State University USA /1994 | Academic | 59 | **10525** 15690 | . . |
| 115 | Cray Y-MP C916/12256 | Tokyo Institute of Technology Tokyo Japan /1995 | Academic | 12 | **10270** 11430 | . . |
| 116 | Intel XP/S25 | NAL Japan /1994 | Research | 336 | **10000** 16800 | . . |
| 117 | Intel XP/S25 | NRAD USA /1994 | Research | 336 | **10000** 16800 | . . |
| 118 | IBM SP2/55 | KTH - Royal Institute of Technology Stockholm Sweden /1995 | Research | 55 | **9825** 14630 | . . |
| 119 | TMC CM-200/64k | Los Alamos National Laboratory Los Alamos USA / . | Research Energy | 2048 | **9800** 20000 | 29696 11264 |
| 120 | TMC CM-200/64k | Los Alamos National Laboratory Los Alamos USA / . | Research Energy | 2048 | **9800** 20000 | 29696 11264 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **$R_{max}$** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 121 | IBM SP2/54 | Autozone USA /1995 | Industry | 54 | **9680** 14400 | . . |
| 122 | Fujitsu VPP500/7 | Institute of Space Astronautical Science (ISAS) Tokyo Japan /1993 | Research | 7 | **9650** 11200 | . . |
| 123 | SGI POWER CHALLENGEarray | Government USA /1995 | Classified | 40 | **9398** 14400 | 27000 6775 |
| 124 | SGI POWER CHALLENGEarray | Government USA /1995 | Classified | 40 | **9398** 14400 | 27000 6775 |
| 125 | IBM SP2/48 | Institute of Math and Statistics Japan /1995 | Research | 48 | **8600** 12770 | . . |
| 126 | IBM SP2/48 | NASA/Langley Research Center Hampton USA /1994 | Research | 48 | **8600** 12770 | . . |
| 127 | IBM SP2/48 | Okazaki Bunshi Ken Japan /1994 | Research | 48 | **8600** 12770 | . . |
| 128 | Parsytec GC PowerPlus/192 | Universitaet Heidelberg - IWR Heidelberg Germany /1995 | Academic | 192 | **7999** 15360 | 27192 9500 |
| 129 | Parsytec GC PowerPlus/192 | Universitaet Paderborn - PC2 Paderborn Germany /1995 | Academic | 192 | **7999** 15360 | 27192 9500 |
| 130 | SGI POWER CHALLENGEarray | Government USA /1995 | Classified | 40 | **7831** 12000 | 27000 6775 |
| 131 | SGI POWER CHALLENGEarray | Government USA /1995 | Classified | 40 | **7831** 12000 | 27000 6775 |
| 132 | SGI POWER CHALLENGEarray | Government USA /1995 | Classified | 40 | **7831** 12000 | 27000 6775 |
| 133 | SGI POWER CHALLENGEarray | Government USA /1995 | Classified | 40 | **7831** 12000 | 27000 6775 |
| 134 | IBM SP2/43 | PIK Potsdam Germany /1994 | Research | 43 | **7725** 11430 | . . |
| 135 | TMC CM-5E/128 | The Angstrom Technology Partnership Tsukuba Japan /1994 | Research | 128 | **7700** 20000 | 18432 8192 |
| 136 | TMC CM-5/128 | AMEX USA /1993 | Industry | 128 | **7700** 16000 | 18432 8192 |
| 137 | TMC CM-5/128 | Government USA /1993 | Classified | 128 | **7700** 16000 | 18432 8192 |
| 138 | TMC CM-5/128 | Institut de Physique du Globe de Paris (IPG) Paris France /1992 | Research | 128 | **7700** 16000 | 18432 8192 |
| 139 | TMC CM-5/128 | JPL Pasadena USA /1995 | Research | 128 | **7700** 16000 | 18432 8192 |
| 140 | TMC CM-5/128 | MIT Cambridge USA / . | Research | 128 | **7700** 16000 | 18432 8192 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | **R$_{max}$**<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 141 | TMC<br>CM-5/128 | Mobil / Technical Center<br>Tulsa USA /1992 | Industry<br>Geophysics | 128 | **7700**<br>16000 | 18432<br>8192 |
| 142 | Intel<br>XP/S20 | Japan Atomic Energy Research<br>Japan /1994 | Research | 256 | **7600**<br>12800 | 16000<br>4000 |
| 143 | Intel<br>XP/S20 | Okayama University<br>Okayama Japan /1994 | Academic | 256 | **7600**<br>12800 | 16000<br>4000 |
| 144 | Intel<br>XP/S20 | Wright Patterson AFB<br>USA /1994 | Research | 256 | **7600**<br>12800 | 16000<br>4000 |
| 145 | SGI<br>POWER CHALLENGEarray | NASA/Ames<br>Mountain View USA /1995 | Research<br>Aerospace | 32 | **7542**<br>11520 | 22000<br>5600 |
| 146 | SGI<br>POWER CHALLENGEarray | NCSA<br>Urbana-Champaign USA /1995 | Research | 32 | **7542**<br>11520 | 22000<br>5600 |
| 147 | SGI<br>POWER CHALLENGEarray | Boston University<br>Boston USA /1995 | Academic | 38 | **7445**<br>11400 | 27000<br>6775 |
| 148 | Hitachi<br>S-3800/180 | Central Res. Inst. of Electric Power Ind.<br>Japan /1994 | Research | 1 | **7400**<br>8000 | 15680<br>470 |
| 149 | Hitachi<br>S-3800/180 | Hitachi LTD. Energy Res. Lab.<br>Japan /1993 | Vendor<br>Research | 1 | **7400**<br>8000 | 15680<br>470 |
| 150 | Hitachi<br>S-3800/180 | Meteorological Research Institute<br>Japan /1993 | Research<br>Weather | 1 | **7400**<br>8000 | 15680<br>470 |
| 151 | IBM<br>SP2/40 | Federal Express<br>USA /1994 | Industry | 40 | **7200**<br>10640 | .<br>. |
| 152 | IBM<br>SP2/40 | IBM/Poughkeepsie<br>Poughkeepsie USA /1995 | Vendor | 40 | **7200**<br>10640 | .<br>. |
| 153 | IBM<br>SP2/40 | National Cancer Research Institute<br>Tokyo Japan /1994 | Research | 40 | **7200**<br>10640 | .<br>. |
| 154 | IBM<br>SP2/40 | Seoul National University<br>Seoul Korea /1995 | Academic | 40 | **7200**<br>10640 | .<br>. |
| 155 | IBM<br>SP2/40 | UNI-C/Lyngby<br>Denmark /1995 | Academic | 40 | **7200**<br>10640 | .<br>. |
| 156 | Hitachi<br>S-3800/260 | Suzuki Motor<br>Japan /1993 | Industry<br>Automotive | 2 | **7100**<br>8000 | .<br>. |
| 157 | IBM<br>SP2/38 | UCLA<br>Los Angeles USA /1994 | Academic | 38 | **6860**<br>10130 | .<br>. |
| 158 | Cray<br>Y-MP C98/8512 | CNRS/IDRIS<br>Orsay France /1993 | Research | 8 | **6850**<br>7619 | .<br>. |
| 159 | Cray<br>Y-MP C98/8256 | Direction de la Meteorologie Nationale<br>Toulouse France /1994 | Research<br>Weather | 8 | **6850**<br>7619 | .<br>. |
| 160 | Cray<br>Y-MP C98/81024 | EDS/General Motors<br>USA /1995 | Industry<br>Automotive | 8 | **6850**<br>7619 | .<br>. |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 161 | Cray Y-MP C98/8512 | Electricite de France Clamart France /1994 | Industry Energy | 8 | **6850** 7619 | . . |
| 162 | Cray Y-MP C916/8512 | Minnesota Supercomputer Center USA /1994 | Academic | 8 | **6850** 7619 | . . |
| 163 | Cray Y-MP C916/8256 | NASA/Ames Research Center/CCF Moffett Field USA /1993 | Research Aerospace | 8 | **6850** 7619 | . . |
| 164 | Cray Y-MP C98/8128 | UCSD/San Diego Supercomputer Center San Diego USA /1993 | Academic | 8 | **6850** 7619 | . . |
| 165 | Cray Y-MP C916/8256 | US Navy/Fleet Numerical Oceanography Center Monterey USA /1994 | Research Weather | 8 | **6850** 7619 | . . |
| 166 | IBM SP2/37 | GMD Germany /1995 | Research | 37 | **6690** 9860 | . . |
| 167 | IBM SP2/36 | Rensselaer Polytechnic Troy USA /1994 | Academic | 36 | **6500** 9570 | . . |
| 168 | Cray T3D MC64-8 | CINECA Bologna Italy /1995 | Research | 64 | **6400** 9600 | 20736 2368 |
| 169 | Cray T3D MC64-2 | Mitsubishi Electric Corporation Kanagawa Japan /1994 | Industry Electronics | 64 | **6400** 9600 | 20736 2368 |
| 170 | Cray T3D MCA64-8 | NASA/Lewis Research Center Cleveland USA /1994 | Research | 64 | **6400** 9600 | 20736 2368 |
| 171 | Cray T3D MCA64-8 | NCAR (National Center for Atmospheric Research) Boulder USA /1994 | Research Weather | 64 | **6400** 9600 | 20736 2368 |
| 172 | IBM SP2/35 | Phillips University of Marburg Marburg Germany /1995 | Academic | 35 | **6340** 9330 | . . |
| 173 | Intel XP/S15 | Government Washington DC USA /1995 | Classified | 208 | **6250** 10400 | . . |
| 174 | Intel XP/S15 | NOAA Boulder USA /1994 | Research | 208 | **6250** 10400 | . . |
| 175 | IBM SP2/33 | PCS Inc USA /1995 | Industry | 33 | **5990** 8800 | . . |
| 176 | Intel XP/S14 | Grant Tensor Houston USA /1995 | Industry Geophysics | 192 | **5800** 9600 | . . |
| 177 | IBM SP2/32 | Amerada Hess USA /1994 | Industry | 32 | **5800** 8500 | 18000 4500 |
| 178 | IBM SP2/32 | CINECA Bologna Italy /1995 | Research | 32 | **5800** 8500 | 18000 4500 |
| 179 | IBM SP2/32 | CNUSC Montpellier France /1995 | Academic | 32 | **5800** 8500 | 18000 4500 |
| 180 | IBM SP2/32 | China Meterological Administration China /1995 | Research | 32 | **5800** 8500 | 18000 4500 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 181 | IBM SP2/32 | Hong Kong University Hong Kong /1995 | Academic | 32 | **5800** 8500 | 18000 4500 |
| 182 | IBM SP2/32 | IBM - Kawasaki Japan /1995 | Vendor | 32 | **5800** 8500 | 18000 4500 |
| 183 | IBM SP2/32 | IBM/Watson Research Center Yorktown Heights USA /1993 | Vendor | 32 | **5800** 8500 | 18000 4500 |
| 184 | IBM SP2/32 | National Center for High Performance Computing Taiwan /1994 | Academic | 32 | **5800** 8500 | 18000 4500 |
| 185 | IBM SP2/32 | PGS Tensor USA /1995 | Industry | 32 | **5800** 8500 | 18000 4500 |
| 186 | IBM SP2/32 | Sherbrooke University Sherbrooke Canada /1995 | Academic | 32 | **5800** 8500 | 18000 4500 |
| 187 | IBM SP2/32 | University of Michigan Michigan USA /1994 | Academic | 32 | **5800** 8500 | 18000 4500 |
| 188 | NEC SX-3/41R | Japan Atomic Energy Research Japan /1992 | Research | 4 | **5800** 6400 | 3584 414 |
| 189 | NEC SX-3/14R | Osaka University Osaka Japan /1993 | Academic | 1 | **5800** 6400 | 2816 282 |
| 190 | NEC SX-3/14R | Toyota Central Research Development Japan /1992 | Industry Automotive | 1 | **5800** 6400 | 2816 282 |
| 191 | Cray Y-MP T94/4128 | Cray Research Eagan USA /1995 | Vendor | 4 | **5711** 7200 | . . |
| 192 | Cray Y-MP T94/4128 | Government Colorado Springs USA /1995 | Classified | 4 | **5711** 7200 | . . |
| 193 | Cray Y-MP T94/4128 | Government Washington DC USA /1995 | Classified | 4 | **5711** 7200 | . . |
| 194 | Cray Y-MP T94/464 | Toyota Motor Company Japan /1995 | Industry Automotive | 4 | **5711** 7200 | . . |
| 195 | TMC CM-5/96 | Epsilon USA /1993 | Industry | 96 | **5700** 13370 | . . |
| 196 | TMC CM-5/96 | University of California at Berkeley USA / . | Academic | 96 | **5700** 13370 | . . |
| 197 | IBM SP2/31 | NIST - US Department of Commerce Gaithersburg USA /1994 | Research | 31 | **5630** 8260 | . . |
| 198 | Fujitsu VPP500/4 | Fujitsu San Jose USA /1995 | Vendor | 4 | **5600** 6400 | 7344 1250 |
| 199 | Fujitsu VPP500/4 | IFP (Institute Francais du Petrole) Rueil-Malmaison France /1995 | Academic Geophysics | 4 | **5600** 6400 | 7344 1250 |
| 200 | Fujitsu VPP500/4 | Toritsu Kagaku Gijutsu University Japan /1993 | Academic | 4 | **5600** 6400 | 7344 1250 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **$R_{max}$** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 201 | Fujitsu VPP500/4 | Toyota Motor Company Japan /1994 | Industry Automotive | 4 | **5600** 6400 | 7344 1250 |
| 202 | Fujitsu/SNI VPP500/4 | Universitaet Aachen Aachen Germany /1993 | Academic | 4 | **5600** 6400 | 7344 1250 |
| 203 | Fujitsu/SNI VPP500/4 | Universitaet Darmstadt Darmstadt Germany /1994 | Academic | 4 | **5600** 6400 | 7344 1250 |
| 204 | IBM SP2/30 | CRS4 Cagliari Italy /1995 | Research | 30 | **5450** 7980 | . . |
| 205 | IBM SP2/30 | Columbia University Lamont USA /1995 | Academic | 30 | **5450** 7980 | . . |
| 206 | IBM SP2/30 | Shell KSEPL Netherlands /1995 | Industry Geophysics | 30 | **5450** 7980 | . . |
| 207 | IBM SP2/30 | Shell KSEPL Netherlands /1995 | Industry Geophysics | 30 | **5450** 7980 | . . |
| 208 | IBM SP2/30 | Shell KSLA Netherlands /1995 | Industry Geophysics | 30 | **5450** 7980 | . . |
| 209 | IBM SP2/30 | Shell Oil Corporation USA /1994 | Industry Geophysics | 30 | **5450** 7980 | . . |
| 210 | IBM SP2/30 | Shell Oil Corporation USA /1994 | Industry Geophysics | 30 | **5450** 7980 | . . |
| 211 | IBM SP2/30 | World Com USA /1995 | Industry | 30 | **5450** 7980 | . . |
| 212 | Parsytec GC PowerPlus/128 | Japan Institute of Advanced Technology Japan /1994 | Research | 128 | **5246** 10240 | 22000 7800 |
| 213 | Parsytec GC PowerPlus/128 | Swedish National Supercomputer Centre Linkoping Sweden /1994 | Academic | 128 | **5246** 10240 | 22000 7800 |
| 214 | Parsytec GC PowerPlus/128 | Technische Universitaet Chemnitz Chemnitz Germany /1994 | Academic | 128 | **5246** 10240 | 22000 7800 |
| 215 | Parsytec GC PowerPlus/128 | Universitaet Hamburg-Harburg Hamburg-Harburg Germany /1994 | Academic | 128 | **5246** 10240 | 22000 7800 |
| 216 | TMC CM-2/64k | Florida State University Tallahassee USA / . | Academic | 2048 | **5200** 14000 | 26624 11000 |
| 217 | TMC CM-2/64k | SRC USA /1993 | Industry | 2048 | **5200** 14000 | 26624 11000 |
| 218 | IBM SP2/28 | L.L.Bean USA /1994 | Industry | 28 | **5100** 7460 | . . |
| 219 | IBM SP2/28 | Loral USA /1994 | Industry | 28 | **5100** 7460 | . . |
| 220 | IBM SP2/28 | Morgan Stanley USA /1995 | Industry | 28 | **5100** 7460 | . . |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **$R_{max}$** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 221 | Meiko CS-2/224 | Lawrence Livermore National Laboratory Livermore USA /1994 | Research Energy | 224 | **5000** 40300 | 18688 6144 |
| 222 | Meiko CS-2/128 | Universitaet Wien Wien Austria /1994 | Academic | 128 | **5000** 23000 | 18688 6144 |
| 223 | Meiko CS-2/64 | Lawrence Livermore National Laboratory Livermore USA /1994 | Research Energy | 64 | **5000** 11500 | 18688 6144 |
| 224 | TMC CM-200/32k | Government USA /1989 | Classified | 1024 | **5000** 10000 | 21504 8192 |
| 225 | TMC CM-200/32k | Minnesota Supercomputer Center USA / . | Academic | 1024 | **5000** 10000 | 21504 8192 |
| 226 | TMC CM-200/32k | Western Geophysical Houston USA /1994 | Industry Geophysics | 1024 | **5000** 10000 | 21504 8192 |
| 227 | Digital AlphaServer 8400 5/300 | Digital Equipment Corporation Maynard USA /1995 | Vendor Benchmarking | 12 | **5000** 7200 | 9548 1148 |
| 228 | NEC SX-3/22 | NEC Systems Laboratories Inc. Houston USA /1991 | Research | 2 | **5000** 5500 | 3072 384 |
| 229 | NEC SX-3/22 | National Aerospace Laboratory (NLR) Noordoostpolder Netherlands /1992 | Research Aerospace | 2 | **5000** 5500 | 3072 384 |
| 230 | NEC SX-3/14 | National Institute of Environmental Studies Japan /1992 | Research Environment | 1 | **5000** 5500 | 3072 384 |
| 231 | IBM SP2/27 | ISSC, Unisource USA /1995 | Industry | 27 | **4920** 7200 | . . |
| 232 | SGI POWER CHALLENGEarray | University of Oregon Eugene USA /1995 | Academic | 24 | **4896** 7200 | 18000 3500 |
| 233 | IBM 9076-005 SP1 | Argonne Nat. Lab USA /1993 | Research | 128 | **4800** 16000 | 26000 6000 |
| 234 | IBM 9076-005 SP1 | IBM/Watson Research Center Yorktown Heights USA /1993 | Vendor | 128 | **4800** 16000 | 26000 6000 |
| 235 | KSR KSR2-80 | Pacific Northwest Laboratories/Batelle Richland USA /1994 | Research | 80 | **4770** 6400 | . . |
| 236 | IBM SP2/26 | John Alden Insurance USA /1994 | Industry | 26 | **4740** 6930 | . . |
| 237 | Cray Y-MP C98/6256 | Chrysler Motors Company USA /1995 | Industry Automotive | 6 | **4630** 5715 | . . |
| 238 | Cray Y-MP C98/6256 | General Electric - Aircraft Eng USA /1995 | Industry Aerospace | 6 | **4630** 5715 | . . |
| 239 | Cray Y-MP C98/6256 | NASA/Goddard Space Flight Center Greenbelt USA /1993 | Research Weather | 6 | **4630** 5715 | . . |
| 240 | SGI POWER CHALLENGE | NASA/JPL Pasadena USA /1995 | Academic | 18 | **4620** 6480 | 2500 540 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 241 | SGI POWER CHALLENGE | Transquest Atlanta USA /1995 | Industry | 18 | **4620** 6480 | 2500 540 |
| 242 | IBM sp2/25 | Shopko Stores USA /1994 | Industry | 25 | **4560** 6660 | . . |
| 243 | Intel XP/S10 | KFA Juelich Germany /1994 | Research | 144 | **4450** 7200 | . . |
| 244 | Intel XP/S10 | Lockheed Advanced Development Palmdale USA /1995 | Industry Aerospace | 144 | **4450** 7200 | . . |
| 245 | Intel XP/S10 | Purdue University USA /1994 | Academic | 144 | **4450** 7200 | . . |
| 246 | IBM SP2/24 | CSC (Centre for Sientific Computing) Helsinki Finland /1995 | Academic | 24 | **4400** 6380 | . . |
| 247 | IBM SP2/24 | Credit Suisse Switzerland /1995 | Industry Finance | 24 | **4400** 6380 | . . |
| 248 | IBM SP2/24 | DKFZ Heidelberg Germany /1995 | Research | 24 | **4400** 6380 | . . |
| 249 | IBM SP2/24 | National Institute of Environmental Studies Japan /1994 | Research | 24 | **4400** 6380 | . . |
| 250 | IBM SP2/24 | Sears Product Ser Grp USA /1995 | Industry | 24 | **4400** 6380 | . . |
| 251 | IBM SP2/24 | US West USA /1994 | Industry | 24 | **4400** 6380 | . . |
| 252 | Intel XP/S10 | Hong Kong University of Science and Technology Hong Kong /1994 | Academic | 140 | **4330** 7000 | . . |
| 253 | Intel XP/S10 | Intel SSD Development Centers USA /1992 | Vendor | 140 | **4330** 7000 | . . |
| 254 | Intel XP/S10 | National Security Agency USA /1994 | Classified | 140 | **4330** 7000 | . . |
| 255 | Cray Y-MP T94/3128 | Chrysler Motors Company USA /1995 | Industry Automotive | 3 | **4327** 5400 | . . |
| 256 | Cray Y-MP T94/3128 | Honda Research and Development Company Tokyo Japan /1995 | Industry Automotive | 3 | **4327** 5400 | . . |
| 257 | Cray Y-MP T94/3128 | debis Stuttgart Germany /1995 | Industry Automotive | 3 | **4327** 5400 | . . |
| 258 | SGI POWER CHALLENGE | Daewoo Motors Korea /1995 | Industry Automotive | 16 | **4323** 5760 | 2500 540 |
| 259 | SGI POWER CHALLENGE | Decision Science Appl. USA /1995 | Industry Geophysics | 16 | **4323** 5760 | 2500 540 |
| 260 | SGI POWER CHALLENGE | Hong Kong University of Science and Technology Hong Kong Hong Kong /1995 | Academic | 16 | **4323** 5760 | 2500 540 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 261 | SGI POWER CHALLENGE | NCSA Urbana-Champaign USA /1995 | Research | 16 | **4323** 5760 | 2500 540 |
| 262 | SGI POWER CHALLENGE | NCSA Urbana-Champaign USA /1995 | Research | 16 | **4323** 5760 | 2500 540 |
| 263 | SGI POWER CHALLENGE | University of Queensland St Lucia Australia /1995 | Academic | 16 | **4323** 5760 | 2500 540 |
| 264 | SGI POWER CHALLENGE | BMW AG Muenchen Germany /1994 | Industry Automotive | 18 | **4142** 5400 | 2604 570 |
| 265 | SGI POWER CHALLENGE | Ford Detroit USA /1995 | Industry Automotive | 18 | **4142** 5400 | 2604 570 |
| 266 | SGI POWER CHALLENGE | MIPS Technologies Inc. - Silicon Graphics Mountain View USA /1994 | Vendor Electronics | 18 | **4142** 5400 | 2604 570 |
| 267 | SGI POWER CHALLENGE | US Naval Research Laboratory Washington D.C. USA /1995 | Research | 18 | **4142** 5400 | 2604 570 |
| 268 | SGI POWER CHALLENGE | Universidad Autonoma Metropolitana Istapalapa Mexico /1994 | Academic | 18 | **4142** 5400 | 2604 570 |
| 269 | SGI POWER CHALLENGE | Vertex Pharmaceuticals Cambridge USA /1995 | Industry Chemistry | 18 | **4142** 5400 | 2604 570 |
| 270 | IBM SP2/22 | Dassault Aviation France /1995 | Industry Aerospace | 22 | **4050** 5850 | . . |
| 271 | IBM SP2/22 | Petro Canada Canada /1995 | Industry Geophysics | 22 | **4050** 5850 | . . |
| 272 | IBM SP2/22 | Queensland Parallel Supercomputing Facility Brisbane Australia /1994 | Academic | 22 | **4050** 5850 | . . |
| 273 | Fujitsu VP2600/10 | Fuji Heavy Japan /1990 | Industry Heavy Ind. | 1 | **4009** 5000 | . . |
| 274 | Fujitsu VP2600/10 | Japan Atomic Energy Research Japan /1991 | Research | 1 | **4009** 5000 | . . |
| 275 | Fujitsu VP2600/10 | Japan Atomic Energy Research Japan /1991 | Research | 1 | **4009** 5000 | . . |
| 276 | Fujitsu VP2600/10E | Kyoto University Kyoto Japan /1995 | Academic | 1 | **4009** 5000 | . . |
| 277 | Fujitsu VP2600/10 | Kyushu University Kyushu Japan /1992 | Academic | 1 | **4009** 5000 | . . |
| 278 | Fujitsu VP2600/10 | NAL (Space Technology) Japan /1992 | Research | 1 | **4009** 5000 | . . |
| 279 | Fujitsu VP2600/10 | Nagoya University Nagoya Japan /1991 | Academic | 1 | **4009** 5000 | . . |
| 280 | Fujitsu VP2600/10 | Reactor Nuclear Fuel Development Japan /1991 | Research | 1 | **4009** 5000 | . . |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 281 | Fujitsu VP2600/10 | Reactor Nuclear Fuel Development Japan /1991 | Research | 1 | **4009** 5000 | . . |
| 282 | Fujitsu VP2600/10 | Taisei Construction Japan /1992 | Industry Construction | 1 | **4009** 5000 | . . |
| 283 | Fujitsu/SNI S600/20 | Universitaet Aachen Aachen Germany /1991 | Academic | 1 | **4009** 5000 | . . |
| 284 | Fujitsu/SNI S600/20 | Universitaet Karlsruhe Karlsruhe Germany /1990 | Academic | 1 | **4009** 5000 | . . |
| 285 | SGI POWER CHALLENGEarray | Cornell Ithaca USA /1995 | Academic | 16 | **3924** 5760 | 15000 2200 |
| 286 | KSR/SNI KSR2-64 | Universitaet Mannheim Mannheim Germany /1995 | Academic | 64 | **3911** 5120 | 9216 3840 |
| 287 | KSR KSR2-64 | University of Washington Seattle USA /1994 | Academic | 64 | **3911** 5120 | 9216 3840 |
| 288 | Parsytec GC PowerPlus/96 | Technische Universitaet Magdeburg Magdeburg Germany /1995 | Academic | 96 | **3865** 7680 | 19000 6500 |
| 289 | TMC CM-5/64 | AMOCO Tulsa USA / . | Industry Geophysics | 64 | **3800** 8192 | 13056 6016 |
| 290 | TMC CM-5/64 | ATR Kyoto Japan / . | Research | 64 | **3800** 8192 | 13056 6016 |
| 291 | TMC CM-5/64 | GMD Birlinghoven Germany /1993 | Research | 64 | **3800** 8192 | 13056 6016 |
| 292 | TMC CM-5/64 | Japanese AIST Hokuriku Japan /1993 | Research | 64 | **3800** 8192 | 13056 6016 |
| 293 | TMC CM-5/64 | Oregon State University USA / . | Academic | 64 | **3800** 8192 | 13056 6016 |
| 294 | TMC CM-5/64 | Real World Computing (RWCP) Tokyo Japan /1992 | Classified | 64 | **3800** 8192 | 13056 6016 |
| 295 | TMC CM-5/64 | University of Wisconsin USA / . | Academic | 64 | **3800** 8192 | 13056 6016 |
| 296 | SGI POWER CHALLENGE | BMW AG Muenchen Germany /1995 | Industry Automotive | 14 | **3767** 5040 | 2000 470 |
| 297 | SGI POWER CHALLENGE | University of Utah Salt Lake City USA /1995 | Academic | 14 | **3767** 5040 | 2000 470 |
| 298 | Convex SPP1200/XA-48 | Universitaet Mainz Mainz Germany /1995 | Academic | 48 | **3722** 11520 | 25100 4300 |
| 299 | Convex SPP1200/XA-32 | CILEA Milano Italy /1995 | Research | 32 | **3722** 7680 | 25100 4300 |
| 300 | Convex SPP1200/XA-32 | Convex Richardson USA /1995 | Vendor Benchmarking | 32 | **3722** 7680 | 25100 4300 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 301 | Convex SPP1200/XA-32 | Ford Dearborn USA /1995 | Industry Automotive | 32 | **3722** 7680 | 25100 4300 |
| 302 | Convex SPP1200/XA-32 | Government USA /1995 | Classified | 32 | **3722** 7680 | 25100 4300 |
| 303 | Convex SPP1200/XA-32 | University of Kentucky Lexington USA /1995 | Academic | 32 | **3722** 7680 | 25100 4300 |
| 304 | IBM SP2/20 | Academia Sinica Singapore /1995 | Research | 20 | **3700** 5320 | . . |
| 305 | IBM SP2/20 | Brown University USA /1995 | Academic | 20 | **3700** 5320 | . . |
| 306 | IBM SP2/20 | First Data Corp. USA /1994 | Industry | 20 | **3700** 5320 | . . |
| 307 | IBM SP2/20 | Gold Star LG Korea /1995 | Industry | 20 | **3700** 5320 | . . |
| 308 | IBM SP2/20 | Western Geophysical UK /1995 | Industry Geophysics | 20 | **3700** 5320 | . . |
| 309 | SGI POWER CHALLENGE | Advanced Geophysical Englewood USA /1995 | Industry Geophysics | 16 | **3700** 4800 | 2500 540 |
| 310 | SGI POWER CHALLENGE | Armstrong Labs USA /1994 | Classified | 16 | **3700** 4800 | 2500 540 |
| 311 | SGI POWER Onyx | CSC (Centre for Sientific Computing) Helsinki Finland /1995 | Academic | 16 | **3700** 4800 | 2500 540 |
| 312 | SGI POWER CHALLENGE | Cornell Ithaca USA /1995 | Academic | 16 | **3700** 4800 | 2500 540 |
| 313 | SGI POWER CHALLENGE | EMBL Heidelberg Germany /1994 | Research | 16 | **3700** 4800 | 2500 540 |
| 314 | SGI POWER CHALLENGE | MIPS Technologies Inc. - Silicon Graphics Mountain View USA /1994 | Vendor Electronics | 16 | **3700** 4800 | 2500 540 |
| 315 | SGI POWER CHALLENGE | NCAR (National Center for Atmospheric Research) Boulder USA /1995 | Research | 16 | **3700** 4800 | 2500 540 |
| 316 | SGI POWER CHALLENGE | Pratt Whitney Canada /1995 | Industry Aerospace | 16 | **3700** 4800 | 2500 540 |
| 317 | SGI POWER CHALLENGE | Reynolds Metals USA /1995 | Industry | 16 | **3700** 4800 | 2500 540 |
| 318 | SGI POWER CHALLENGE | Silicon Graphics Singapore /1995 | Vendor Benchmarking | 16 | **3700** 4800 | 2500 540 |
| 319 | SGI POWER CHALLENGE | Silicon Graphics Detroit USA /1995 | Vendor Benchmarking | 16 | **3700** 4800 | 2500 540 |
| 320 | SGI POWER CHALLENGE | Silicon Graphics Houston USA /1994 | Vendor | 16 | **3700** 4800 | 2500 540 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 321 | SGI POWER CHALLENGE | Silicon Graphics Tokyo Japan /1994 | Vendor Benchmarking | 16 | **3700** 4800 | 2500 540 |
| 322 | SGI POWER CHALLENGE | Stanford University Palo Alto USA /1995 | Academic | 16 | **3700** 4800 | 2500 540 |
| 323 | SGI POWER CHALLENGE | Texas AM University College Station USA /1994 | Academic | 16 | **3700** 4800 | 2500 540 |
| 324 | SGI POWER CHALLENGE | The Aeronautical Res. Inst. of Sweden Bromma Sweden /1995 | Research CFD | 16 | **3700** 4800 | 2500 540 |
| 325 | SGI POWER CHALLENGE | UNI-C/Aarhus Copenhagen Denmark /1995 | Academic | 16 | **3700** 4800 | 2500 540 |
| 326 | SGI/SNI POWER CHALLENGE | Universitaet Koeln Koeln Germany /1995 | Academic | 16 | **3700** 4800 | 2500 540 |
| 327 | SGI POWER CHALLENGE | University of Southern California Los Angeles USA /1994 | Academic | 16 | **3700** 4800 | 2500 540 |
| 328 | SGI POWER CHALLENGE | Western Geophysical Houston USA /1995 | Industry Geophysics | 16 | **3700** 4800 | 2500 540 |
| 329 | SGI POWER CHALLENGE | Western Geophysical Houston USA /1995 | Industry Geophysics | 16 | **3700** 4800 | 2500 540 |
| 330 | SGI POWER CHALLENGE | Western Geophysical Houston USA /1995 | Industry Geophysics | 16 | **3700** 4800 | 2500 540 |
| 331 | Fujitsu/SNI S400/40 | Universitaet Darmstadt Darmstadt Germany /1991 | Academic | 2 | **3624** 5000 | 10239 . |
| 332 | Fujitsu/SNI S400/40 | Universitaet Hannover Hannover Germany /1991 | Academic | 2 | **3624** 5000 | 10239 . |
| 333 | Intel XP/S8 | National Security Agency USA /1994 | Classified | 110 | **3430** 5500 | . . |
| 334 | SGI POWER CHALLENGE | AMOCO Dallas USA /1995 | Industry Geophysics | 12 | **3398** 4320 | 2000 450 |
| 335 | SGI POWER CHALLENGE | Genentech San Franzisko USA /1995 | Industry | 12 | **3398** 4320 | 2000 450 |
| 336 | SGI POWER CHALLENGE | Institute for Defense Analysis USA /1995 | Classified | 12 | **3398** 4320 | 2000 450 |
| 337 | SGI POWER CHALLENGE | Marathon Oil Company Houston USA /1995 | Industry Geophysics | 12 | **3398** 4320 | 2000 450 |
| 338 | SGI POWER CHALLENGE | Michelin Clermont-Ferrand France /1995 | Industry Automotive | 12 | **3398** 4320 | 2000 450 |
| 339 | SGI POWER CHALLENGE | Missle Space Intelligence Center Huntsville USA /1995 | Classified | 12 | **3398** 4320 | 2000 450 |
| 340 | SGI POWER CHALLENGE | Missle Space Intelligence Center Huntsville USA /1995 | Classified | 12 | **3398** 4320 | 2000 450 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 341 | SGI POWER CHALLENGE | NASA/Goddard Space Flight Center Greenbelt USA /1995 | Research Aerospace | 12 | **3398** 4320 | 2000 450 |
| 342 | SGI POWER CHALLENGE | NASA/Langley Research Center Langley USA /1995 | Research | 12 | **3398** 4320 | 2000 450 |
| 343 | SGI POWER CHALLENGE | NASA/Langley Research Center Langley USA /1995 | Research | 12 | **3398** 4320 | 2000 450 |
| 344 | SGI POWER CHALLENGE | Oxford Physiology Oxford UK /1995 | Research | 12 | **3398** 4320 | 2000 450 |
| 345 | SGI POWER CHALLENGE | UNI-C/Aarhus Copenhagen Denmark /1995 | Academic | 12 | **3398** 4320 | 2000 450 |
| 346 | SGI POWER CHALLENGE | University of Minnesota Minneapolis USA /1995 | Academic | 12 | **3398** 4320 | 2000 450 |
| 347 | SGI POWER CHALLENGE | University of Minnesota Minneapolis USA /1995 | Academic | 12 | **3398** 4320 | 2000 450 |
| 348 | KSR KSR1-128 | University of Cincinati USA /1993 | Academic | 128 | **3380** 5120 | 10240 1824 |
| 349 | IBM SP2/18 | American Airlines USA /1995 | Industry Aerospace | 18 | **3320** 4800 | . . |
| 350 | IBM SP2/18 | Household International USA /1995 | Industry | 18 | **3320** 4800 | . . |
| 351 | IBM SP2/18 | National Library of Australia Australia /1995 | Research | 18 | **3320** 4800 | . . |
| 352 | IBM SP2/18 | Samsung Korea /1995 | Industry Electronics | 18 | **3320** 4800 | . . |
| 353 | IBM SP2/18 | Westinghouse Electric USA /1995 | Industry Energy | 18 | **3320** 4800 | . . |
| 354 | Convex SPP1000/XA-64 | Convex Richardson USA /1994 | Vendor Benchmarking | 64 | **3306** 12800 | 25800 4700 |
| 355 | Convex SPP1000/XA-64 | HTC Babelsberg Germany /1995 | Industry | 64 | **3306** 12800 | 25800 4700 |
| 356 | Convex SPP1000/XA-64 | Josef Stefan Institut Ljubljana Slovenia /1994 | Research | 64 | **3306** 12800 | 25800 4700 |
| 357 | Convex SPP1000/XA-64 | NCSA Urbana-Champaign USA /1995 | Academic | 64 | **3306** 12800 | 25800 4700 |
| 358 | Convex SPP1000/XA-48 | Universitaet Erlangen Erlangen Germany /1994 | Academic | 48 | **3306** 9600 | 25800 4700 |
| 359 | Convex SPP1000/XA-32 | JCCWC San Antonio USA /1995 | Classified | 32 | **3306** 6400 | 25800 4700 |
| 360 | Convex SPP1000/XA-32 | The Scripps Research Institute La Jolla USA /1994 | Industry Chemistry | 32 | **3306** 6400 | 25800 4700 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 361 | Convex SPP1000/XA-32 | Tokyo University Tokyo Japan /1995 | Academic | 32 | **3306** 6400 | 25800 4700 |
| 362 | Convex SPP1000/XA-32 | US Naval Research and Development Center San Diego USA /1995 | Research | 32 | **3306** 6400 | 25800 4700 |
| 363 | Convex SPP1000/XA-32 | University of Michigan Ann Arbor USA /1994 | Academic | 32 | **3306** 6400 | 25800 4700 |
| 364 | Cray Y-MP C94A/4128 | Bristol-Myers Squibb Institute USA /1994 | Industry Chemistry | 4 | **3275** 3810 | . . |
| 365 | Cray Y-MP C94/4256 | CEA/Centre d'Etudes Nucleaires Grenoble France /1994 | Research Energy | 4 | **3275** 3810 | . . |
| 366 | Cray Y-MP C94/4256 | CSC (Center for Scientific Computing) Espoo Finland /1995 | Academic | 4 | **3275** 3810 | . . |
| 367 | Cray Y-MP C94A/4128 | Citroen Peugeot Velizy France /1994 | Industry Automotive | 4 | **3275** 3810 | . . |
| 368 | Cray Y-MP C94/4256 | Compagnie Generale de Geophysique (CGG) Massy France /1995 | Industry Geophysics | 4 | **3275** 3810 | . . |
| 369 | Cray Y-MP C94/4128 | Du Pont De Nemours Company USA /1994 | Industry Chemistry | 4 | **3275** 3810 | . . |
| 370 | Cray Y-MP C94/4256 | EDS/ Adam Opel AG Ruesselsheim Germany /1995 | Industry Automotive | 4 | **3275** 3810 | . . |
| 371 | Cray Y-MP C94A/4128 | Instituto National de Meteorologia (INM) Spain /1994 | Research Weather | 4 | **3275** 3810 | . . |
| 372 | Cray Y-MP C94/4256 | Renault Rueil-Malmaison France /1995 | Industry Automotive | 4 | **3275** 3810 | . . |
| 373 | Cray Y-MP C98/4256 | SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1994 | Academic | 4 | **3275** 3810 | . . |
| 374 | Cray Y-MP C94/41024 | Toshiba Kanagawa Japan /1995 | Academic | 4 | **3275** 3810 | . . |
| 375 | Cray Y-MP C94/41024 | Universitaet Stuttgart Stuttgart Germany /1994 | Research | 4 | **3275** 3810 | . . |
| 376 | Cray Y-MP C94/4256 | debis Stuttgart Germany /1994 | Industry Automotive | 4 | **3275** 3810 | . . |
| 377 | Intel XP/S7 | University of Bergen Bergen Norway /1994 | Academic | 103 | **3210** 5150 | . . |
| 378 | SGI POWER CHALLENGE | Caltech Pasadena USA /1995 | Academic | 14 | **3203** 4200 | 2000 470 |
| 379 | SGI POWER CHALLENGE | Princeton University Princeton USA /1995 | Academic | 14 | **3203** 4200 | 2000 470 |
| 380 | SGI POWER CHALLENGE | Technical University Eindhoven Netherlands /1994 | Academic | 14 | **3203** 4200 | 2000 470 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | **R$_{max}$**<br>$R_{peak}$<br>[Mflop/$s$] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 381 | SGI<br>POWER CHALLENGE | Texaco<br>Houston USA /1995 | Industry<br>Geophysics | 14 | **3203**<br>4200 | 2000<br>470 |
| 382 | SGI<br>POWER CHALLENGE | Unilever<br>Port Sunlight UK /1994 | Industry<br>Chemistry | 14 | **3203**<br>4200 | 2000<br>470 |
| 383 | SGI<br>POWER CHALLENGE | University of Athens<br>Athen Greece /1994 | Academic | 14 | **3203**<br>4200 | 2000<br>470 |
| 384 | SGI<br>POWER CHALLENGE | University of Calgary<br>Calgary Canada /1994 | Academic | 14 | **3203**<br>4200 | 2000<br>470 |
| 385 | Cray<br>T3D MCA32-8 | Chrysler Motors Company<br>USA /1994 | Industry<br>Automotive | 32 | **3200**<br>4800 | 14592<br>1616 |
| 386 | Cray<br>T3D MCA32-8 | North Carolina Supercomputer Center<br>USA /1994 | Academic | 32 | **3200**<br>4800 | 14592<br>1616 |
| 387 | Cray<br>T3D MCA32-8 | Ohio Supercomputer Center<br>Columbus USA /1994 | Academic | 32 | **3200**<br>4800 | 14592<br>1616 |
| 388 | Cray<br>T3D MCA32-8 | Universitaet Stuttgart<br>Stuttgart Germany /1994 | Research | 32 | **3200**<br>4800 | 14592<br>1616 |
| 389 | IBM<br>SP2/17 | Samsung<br>Korea /1995 | Industry<br>Electronics | 17 | **3140**<br>4530 | .<br>. |
| 390 | SGI<br>POWER CHALLENGEarray | Rice University<br>Houston USA /1995 | Academic | 16 | **3095**<br>4800 | 19000<br>5400 |
| 391 | IBM<br>SP2/16 | CEA<br>Saclay France /1995 | Research | 16 | **3000**<br>4300 | 13000<br>2600 |
| 392 | IBM<br>SP2/16 | Catholic University of Leuven<br>Belgium /1994 | Academic | 16 | **3000**<br>4300 | 13000<br>2600 |
| 393 | IBM<br>SP2/16 | Cogate-Palmolive<br>USA /1994 | Industry | 16 | **3000**<br>4300 | 13000<br>2600 |
| 394 | IBM<br>SP2/16 | Daresbury Laboratory<br>UK /1995 | Research<br>Chemistry | 16 | **3000**<br>4300 | 13000<br>2600 |
| 395 | IBM<br>SP2/16 | Emory University<br>USA /1995 | Academic | 16 | **3000**<br>4300 | 13000<br>2600 |
| 396 | IBM<br>SP2/16 | Ensign<br>UK /1995 | Industry<br>Geophysics | 16 | **3000**<br>4300 | 13000<br>2600 |
| 397 | IBM<br>SP2/16 | European Space Agency (ESTEC)<br>Noordwijk Netherlands /1994 | Research<br>Aerospace | 16 | **3000**<br>4300 | 13000<br>2600 |
| 398 | IBM<br>SP2/16 | GSI<br>Darmstadt Germany /1995 | Research | 16 | **3000**<br>4300 | 13000<br>2600 |
| 399 | IBM<br>SP2/16 | IBM<br>Rome Italy /1995 | Vendor<br>Software | 16 | **3000**<br>4300 | 13000<br>2600 |
| 400 | IBM<br>SP2/16 | IN2P3<br>France /1995 | Research | 16 | **3000**<br>4300 | 13000<br>2600 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 401 | IBM SP2/16 | Louisiana State University USA /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 402 | IBM SP2/16 | Maui High-Performance Computing Center (MHPCC) USA /1994 | Research | 16 | **3000** 4300 | 13000 2600 |
| 403 | IBM SP2/16 | Maui High-Performance Computing Center (MHPCC) USA /1994 | Research | 16 | **3000** 4300 | 13000 2600 |
| 404 | IBM SP2/16 | National Supercomputing Research Center (NSRC) Singapore /1995 | Research | 16 | **3000** 4300 | 13000 2600 |
| 405 | IBM SP2/16 | Oak Ridge National Laboratory Oakk Ridge USA /1994 | Research | 16 | **3000** 4300 | 13000 2600 |
| 406 | IBM SP2/16 | Princeton University Princeton USA /1994 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 407 | IBM SP2/16 | Ryukoku University Seta Japan /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 408 | IBM SP2/16 | Stanford University USA /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 409 | IBM SP2/16 | Technische Universitaet Cottbus Cottbus Germany /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 410 | IBM SP2/16 | University of Maryland USA /1994 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 411 | IBM SP2/16 | University of Notre Dame USA /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 412 | IBM SP2/16 | University of Oslo Norway /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 413 | IBM SP2/16 | University of Southampton Southampton UK /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 414 | IBM SP2/16 | University of Southern California Los Angeles USA /1994 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 415 | IBM SP2/16 | University of Wisconsin USA /1994 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 416 | IBM SP2/16 | University of Zurich Zurich Switzerland /1995 | Academic | 16 | **3000** 4300 | 13000 2600 |
| 417 | IBM SP2/16 | VEW (Ver. Elekt. Westfalen) Germany /1995 | Industry Energy | 16 | **3000** 4300 | 13000 2600 |
| 418 | IBM SP2/16 | Western Geophysical Houston USA /1994 | Industry Geophysics | 16 | **3000** 4300 | 13000 2600 |
| 419 | Cray Y-MP T94/264 | Nipondenso Japan /1995 | Industry Automotive | 2 | **2943** 3600 | . . |
| 420 | NEC SX-3/12R | Institute of Space Science (INPE) Brazil /1994 | Research Weather | 1 | **2900** 3200 | 2048 174 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 421 | NEC SX-3/12R | NEC Scientific Information Systems Dev. (NSIS) Japan /1992 | Research | 1 | **2900** 3200 | 2048 174 |
| 422 | NEC SX-3/21R | Obayashi Corporation Japan /1992 | Industry | 2 | **2900** 3200 | 2560 257 |
| 423 | Convex C4/XA-4 | Ford Dearborn USA /1994 | Industry Automotive | 4 | **2896** 3240 | 4000 400 |
| 424 | Convex C4/XA-4 | Government USA /1995 | Classified | 4 | **2896** 3240 | 4000 400 |
| 425 | Convex C4/XA-4 | Shell The Hague Netherlands /1995 | Industry Geophysics | 4 | **2896** 3240 | 4000 400 |
| 426 | SGI POWER CHALLENGE | Air Force/Eglin Air Force Base Eglin USA /1995 | Classified | 12 | **2874** 3600 | 2000 450 |
| 427 | SGI POWER CHALLENGE | BASF Ludwigshafen Germany /1994 | Industry Chemistry | 12 | **2874** 3600 | 2000 450 |
| 428 | SGI POWER CHALLENGE | BMW AG/ Rolls-Royce Dahlewitz Germany /1994 | Industry Aerospace | 12 | **2874** 3600 | 2000 450 |
| 429 | SGI POWER CHALLENGE | Bayer AG Leverkusen Germany /1994 | Industry Chemistry | 12 | **2874** 3600 | 2000 450 |
| 430 | SGI POWER CHALLENGE | Bayer AG Mannheim Germany /1994 | Industry Chemistry | 12 | **2874** 3600 | 2000 450 |
| 431 | SGI POWER CHALLENGE | Bayer AG Wuppertal Germany /1995 | Industry Chemistry | 12 | **2874** 3600 | 2000 450 |
| 432 | SGI POWER CHALLENGE | Bristol-Myers Squibb USA /1995 | Industry Chemistry | 12 | **2874** 3600 | 2000 450 |
| 433 | SGI POWER CHALLENGE | Bristol-Myers Squibb USA /1995 | Industry Chemistry | 12 | **2874** 3600 | 2000 450 |
| 434 | SGI POWER CHALLENGE | Bristol-Myers Squibb USA /1995 | Industry Chemistry | 12 | **2874** 3600 | 2000 450 |
| 435 | SGI POWER CHALLENGE | CERCA Montreal Canada /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 436 | SGI POWER CHALLENGE | Centre Etude Nucleaire Grenoble France /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 437 | SGI POWER CHALLENGE | Centre Etude Nucleaire Grenoble France /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 438 | SGI POWER CHALLENGE | Coleman Research Huntsville USA /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 439 | SGI POWER CHALLENGE | Defense Research Agency Ford Halstead UK /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 440 | SGI/SNI POWER CHALLENGE | FU Berlin Berlin Germany /1994 | Academic | 12 | **2874** 3600 | 2000 450 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 441 | SGI POWER CHALLENGE | General Motors Detroit USA /1995 | Industry Automotive | 12 | **2874** 3600 | 2000 450 |
| 442 | SGI POWER CHALLENGE | General Motors Detroit USA /1995 | Industry Automotive | 12 | **2874** 3600 | 2000 450 |
| 443 | SGI POWER CHALLENGE | Georgia Institute of Technology Atlanta USA /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 444 | SGI POWER CHALLENGE | Indiana University Bloomington USA /1994 | Academic | 12 | **2874** 3600 | 2000 450 |
| 445 | SGI POWER CHALLENGE | Jackson State University Jackson USA /1994 | Academic Chemistry | 12 | **2874** 3600 | 2000 450 |
| 446 | SGI POWER CHALLENGE | Lawrence Livermore National Laboratory Livermore USA /1995 | Research Energy | 12 | **2874** 3600 | 2000 450 |
| 447 | SGI POWER CHALLENGE | Missle Space Intelligence Center Huntsville USA /1995 | Classified Defense | 12 | **2874** 3600 | 2000 450 |
| 448 | SGI POWER CHALLENGE | Mobil Dallas USA /1994 | Industry Geophysics | 12 | **2874** 3600 | 2000 450 |
| 449 | SGI POWER CHALLENGE | Pacific Northwest Lab. Hanford USA /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 450 | SGI POWER CHALLENGE | Pacific Northwest Lab. Hanford USA /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 451 | SGI POWER CHALLENGE | Paradigm Geophysical UK /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 452 | SGI POWER CHALLENGE | Stanford University Palo Alto USA /1995 | Academic | 12 | **2874** 3600 | 2000 450 |
| 453 | SGI POWER CHALLENGE | Thomson/EDF France /1994 | Industry Energy | 12 | **2874** 3600 | 2000 450 |
| 454 | SGI POWER CHALLENGE | US Army Research Laboratory Aberdeen USA /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 455 | SGI POWER CHALLENGE | US Army Research Laboratory Aberdeen USA /1995 | Research | 12 | **2874** 3600 | 2000 450 |
| 456 | SGI POWER CHALLENGE | US Naval Air Warfare Center China Lake USA /1994 | Classified | 12 | **2874** 3600 | 2000 450 |
| 457 | SGI POWER CHALLENGE | University of Bristol Bristol UK /1995 | Academic | 12 | **2874** 3600 | 2000 450 |
| 458 | SGI POWER CHALLENGE | University of Chicago Chicago USA /1994 | Academic | 12 | **2874** 3600 | 2000 450 |
| 459 | SGI POWER CHALLENGE | University of Liverpool Liverpool UK /1995 | Academic | 12 | **2874** 3600 | 2000 450 |
| 460 | SGI POWER CHALLENGE | University of Minnesota Minneapolis USA /1995 | Academic | 12 | **2874** 3600 | 2000 450 |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 461 | SGI POWER CHALLENGE | University of Utah Salt Lake City USA /1995 | Academic | 12 | **2874** 3600 | 2000 450 |
| 462 | SGI POWER CHALLENGE | Unocal Houston USA /1995 | Industry Geophysics | 12 | **2874** 3600 | 2000 450 |
| 463 | SGI POWER CHALLENGE | Volvo Gothenberg Sweden /1995 | Industry Automotive | 12 | **2874** 3600 | 2000 450 |
| 464 | SGI POWER CHALLENGE | Western Atlas Houston USA /1995 | Industry Geophysics | 12 | **2874** 3600 | 2000 450 |
| 465 | SGI POWER CHALLENGE | AUC Denmark /1995 | Academic | 10 | **2830** 3600 | 2000 400 |
| 466 | SGI POWER CHALLENGE | Air Liquide France /1995 | Industry Chemistry | 10 | **2830** 3600 | 2000 400 |
| 467 | SGI POWER CHALLENGE | Florida State University Tallahassee USA /1995 | Academic | 10 | **2830** 3600 | 2000 400 |
| 468 | SGI POWER CHALLENGE | George Wasington University Ashburg USA /1995 | Academic | 10 | **2830** 3600 | 2000 400 |
| 469 | SGI POWER CHALLENGE | McDonell Douglas Huntington USA /1995 | Industry Aerospace | 10 | **2830** 3600 | 2000 400 |
| 470 | SGI POWER CHALLENGE | NASA/JPL Pasadena USA /1995 | Academic | 10 | **2830** 3600 | 2000 400 |
| 471 | SGI POWER CHALLENGE | NASA/Langley Research Center Langley USA /1995 | Research | 10 | **2830** 3600 | 2000 400 |
| 472 | SGI POWER CHALLENGE | Renault France /1995 | Industry Automotive | 10 | **2830** 3600 | 2000 400 |
| 473 | SGI POWER CHALLENGE | Schlumberger Doll Research Ridgefield USA /1995 | Industry Geophysics | 10 | **2830** 3600 | 2000 400 |
| 474 | SGI POWER CHALLENGE | Schlumberger Well Service Austin USA /1995 | Industry Geophysics | 10 | **2830** 3600 | 2000 400 |
| 475 | SGI POWER CHALLENGE | University of Cincinnatti Cincinnatti USA /1995 | Academic | 10 | **2830** 3600 | 2000 400 |
| 476 | Parsytec GC PowerPlus/64 | CRS4 Cagliari Italy /1994 | Research | 64 | **2827** 5120 | 16000 4500 |
| 477 | Parsytec GC PowerPlus/64 | Universitaet Bochum Bochum Germany /1995 | Academic | 64 | **2827** 5120 | 16000 4500 |
| 478 | Parsytec GC PowerPlus/64 | University of Bergen Norway /1994 | Academic | 64 | **2827** 5120 | 16000 4500 |
| 479 | IBM SP2/15 | University of Gdansk Gdansk Poland /1995 | Academic | 15 | **2810** 3990 | . . |
| 480 | IBM SP2/15 | University of Geneva Geneva Switzerland /1995 | Academic | 15 | **2810** 3990 | . . |

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## TOP500 **Supercomputers - Worldwide**

| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | **Rmax** $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 481 | IBM SP2/15 | University of Poznan Pozan Poland /1995 | Academic | 15 | **2810** 3990 | . . |
| 482 | IBM SP2/15 | University of Wroclaw Wroclaw Poland /1995 | Academic | 15 | **2810** 3990 | . . |
| 483 | Meiko CS-2/32 | CERFACS Toulouse France /1994 | Research | 32 | **2800** 5800 | 13824 3488 |
| 484 | Meiko CS-2/32 | CERN Geneva Switzerland /1994 | Research | 32 | **2800** 5800 | 13824 3488 |
| 485 | Convex SPP1200/XA-24 | University of Linz Linz Austria /1995 | Academic | 24 | **2736** 5760 | 19800 3360 |
| 486 | IBM SP2/14 | Argonne Nat. Lab - DIS USA /1994 | Research | 14 | **2625** 3720 | . . |
| 487 | IBM SP2/14 | CEA/CESTA Bordeaux France /1995 | Research | 14 | **2625** 3720 | . . |
| 488 | IBM SP2/14 | Federal Home Loan Mortgage Corp. USA /1995 | Industry | 14 | **2625** 3720 | . . |
| 489 | IBM SP2/14 | KFA Juelich Germany /1995 | Research | 14 | **2625** 3720 | . . |
| 490 | IBM SP2/14 | Montan University of Loeben Loeben Austria /1995 | Academic | 14 | **2625** 3720 | . . |
| 491 | IBM SP2/14 | University of Liege Belgium /1995 | Academic | 14 | **2625** 3720 | . . |
| 492 | Intel iPSC/860 | Alliant Techsystems Inc. USA /1990 | Industry Biochemistry | 128 | **2600** 5120 | 12000 4500 |
| 493 | Intel iPSC/860 | Grant Tensor Houston USA /1991 | Industry Geophysics | 128 | **2600** 5120 | 12000 4500 |
| 494 | Intel iPSC/860 | Grant Tensor London UK /1991 | Industry Geophysics | 128 | **2600** 5120 | 12000 4500 |
| 495 | Intel iPSC/860 | Lockheed Advanced Development Palmdale USA /1992 | Industry Aerospace | 128 | **2600** 5120 | 12000 4500 |
| 496 | Intel iPSC/860 | NASA/Ames Research Center/NAS Moffett Field USA /1990 | Research | 128 | **2600** 5120 | 12000 4500 |
| 497 | Intel iPSC/860 | NIH Frederick USA /1990 | Research | 128 | **2600** 5120 | 12000 4500 |
| 498 | Intel iPSC/860 | ONERA Chatillon France /1991 | Research Aerospace | 128 | **2600** 5120 | 12000 4500 |
| 499 | Intel iPSC/860 | Oak Ridge National Laboratory Oak Ridge USA /1989 | Research | 128 | **2600** 5120 | 12000 4500 |
| 500 | Cray Y-MP C94/364 | Environmental Protection Agency USA /1995 | Research | 3 | **2489** 2857 | . . |

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# 4 Statistics on Manufacturers and Continents

As basic statistics of the complete list, we give the number of systems installed with respect to the different manufacturers in the different countries or continents (Table 2) as well as the accumulated $R_{max}$ values (Table 3) and $R_{peak}$ values (Table 4) for those systems. More extensive analyses of the situation and its evolution over time can be found in the series of TOP500Reports (TOP500Report 1993 [4], 1994 [5] and 1995 [6]). Customized statistics can be obtained by using WWW at http://parallel.rz.uni-mannheim.de/top500.html or http://www.netlib.org/benchmark/top500.html.

Table 2: Number of Systems Installed

| **TOP500 Statistics — Number of Systems Installed** | | | | | |
|---|---|---|---|---|---|
| | USA/Canada | Europe | Japan | others | Total |
| SGI | 88 | 31 | 1 | 5 | 125 |
| IBM | 56 | 41 | 8 | 11 | 116 |
| Cray | 53 | 28 | 10 | 1 | 92 |
| Intel | 24 | 6 | 3 | 1 | 34 |
| Fujitsu | 1 | 7 | 25 | | 33 |
| TMC | 25 | 2 | 4 | | 31 |
| Convex | 12 | 7 | 1 | | 20 |
| NEC | 4 | 4 | 11 | 1 | 20 |
| Parsytec | | 9 | 1 | | 10 |
| others | 6 | 4 | 9 | | 19 |
| Total | 269 | 139 | 73 | 19 | 500 |

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Table 3: Installed $\mathbf{R_{max}}$

| **TOP500 Statistics — Installed $R_{max}$ [Gflop/s]** | | | | | |
|---|---|---|---|---|---|
| | USA/Canada | Europe | Japan | others | Total |
| SGI | 388.0 | 110.5 | 3.7 | 20.8 | 523.0 |
| IBM | 549.5 | 201.3 | 61.2 | 48.8 | 860.9 |
| Cray | 804.7 | 280.8 | 85.9 | 13.7 | 1185.2 |
| Intel | 444.9 | 43.8 | 25.2 | 4.3 | 518.2 |
| Fujitsu | 5.6 | 32.1 | 707.9 | | 745.5 |
| TMC | 335.8 | 11.5 | 19.1 | | 366.4 |
| Convex | 40.5 | 23.0 | 3.3 | | 66.8 |
| NEC | 63.7 | 39.8 | 164.3 | 2.9 | 270.7 |
| Parsytec | | 44.1 | 5.2 | | 49.3 |
| others | 27.1 | 14.5 | 157.7 | | 199.3 |
| Total | 2659.8 | 801.4 | 1233.6 | 90.6 | 4785.4 |

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Table 4: Installed $\mathbf{R_{peak}}$

| **TOP500 Statistics — Installed $R_{peak}$ [Gflop/s]** | | | | | |
|---|---|---|---|---|---|
| | USA/Canada | Europe | Japan | others | Total |
| SGI | 538.9 | 144.2 | 4.8 | 27.5 | 715.4 |
| IBM | 841.7 | 294.1 | 90.6 | 71.1 | 1297.4 |
| Cray | 1080.8 | 379.3 | 109.5 | 15.2 | 1584.9 |
| Intel | 609.5 | 59.8 | 42.4 | 7.0 | 718.7 |
| Fujitsu | 6.4 | 39.2 | 897.2 | | 942.8 |
| TMC | 734.7 | 24.2 | 44.6 | | 803.5 |
| Convex | 88.4 | 63.4 | 6.4 | | 158.2 |
| NEC | 69.5 | 44.5 | 179.6 | 3.2 | 296.8 |
| Parsytec | | 84.5 | 10.2 | | 94.7 |
| others | 75.6 | 39.7 | 176.0 | | 291.4 |
| Total | 4045.7 | 1172.9 | 1561.3 | 124.0 | 6903.8 |

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