# TOP500 Supercomputer Sites

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# 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.

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 [2]. 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. In an attempt to obtain uniformity across all computers in performance reporting, the algorithm used in solving the system of equations in the benchmark procedure must confirm to the standard operation count for LU factorization with partial pivoting. In particular, the operation count for the algorithm must be $2/3n^3 + O(n^2)$ floating point operations. This excludes the use of a fast matrix multiply algorithm like "Strassian's Method". This is done to provide a comparable set of performance numbers across all computers. 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[1] |
| • $R_{max}$ | 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 [2] is not available, we use the TPP performance given in Table 1 of the LINPACK Report [2] for solving a system of 1000 equations. To use a consistent yardstick for all systemwe we do not use results achieved by advanced parallel algorithm as defined in [2]. In case of the Cray T90, C90 and J90 systems we had to use older able 3 or Table 1 results. In a few cases we interpolated between two measured system sizes.

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 addition to cross checking different sources of information, we select randomly a statistical representative sample of the first 500 systems of our database. For these systems we ask the supplier of the information to establish direct contact between the installation site and us to verify the given information. This gives us basic information about the quality of the list in total.

As the TOP500 should provide a basis for statistics on the market of high-performance computers, we limit the number of systems installed at vendor sites. This is done for each vendor separately by limiting the accumulated performance of systems at vendor sites to a maximum of 5% of the total accumulated installed performance of this vendor. Rounding is done in favor of the vendor in question.

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. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 1 | Intel<br>ASCI Red | Sandia National Labs<br>Albuquerque USA /1997 | Research | 7264 | **1068000**<br>1453000 | 215000<br>53400 |
| 2 | Hitachi/Tsukuba<br>CP-PACS/2048 | Center for Computational Physics, Univ of Tsukuba<br>Tsukuba Japan /1996 | Academic | 2048 | **368200**<br>614000 | 103680<br>30720 |
| 3 | SGI/Cray<br>T3E900 LC696-128 | United Kingdom Meteorological Office<br>Bracknell UK /1997 | Research<br>Weather | 696 | **264800**<br>626400 | .<br>. |
| 4 | Fujitsu<br>Numerical Wind Tunnel | NAL<br>Japan /1996 | Research<br>Aerospace | 167 | **229700**<br>281000 | 66132<br>18018 |
| 5 | Hitachi<br>SR2201/1024 | University of Tokyo<br>Tokyo Japan /1996 | Academic | 1024 | **220400**<br>307000 | 138240<br>34560 |
| 6 | SGI/Cray<br>T3E LC512-128 | Forschungszentrum Juelich (FZJ)<br>Juelich Germany /1996 | Research | 512 | **176000**<br>307200 | .<br>. |
| 7 | SGI/Cray<br>T3E LC512-128 | Government<br>USA /1997 | Classified | 512 | **176000**<br>307200 | .<br>. |
| 8 | SGI/Cray<br>T3E LC512-128 | Max-Planck-Gesellschaft MPI/IPP<br>Garching Germany /1997 | Research | 512 | **176000**<br>307200 | .<br>. |
| 9 | SGI/Cray<br>T3E LC512-128 | NASA/Goddard Space Flight Center<br>Greenbelt USA /1996 | Research<br>Weather | 512 | **176000**<br>307200 | .<br>. |
| 10 | SGI/Cray<br>T3E LC512-128 | Pittsburgh Supercomputer Center<br>Pittsburgh USA /1996 | Research | 512 | **176000**<br>307200 | .<br>. |
| 11 | SGI/Cray<br>T3E LC512-128 | Universitaet Stuttgart<br>Stuttgart Germany /1996 | Research | 512 | **176000**<br>307200 | .<br>. |
| 12 | IBM<br>SP2 P2 120MHz/472 | Pacific Northwest Laboratories/Batelle<br>Richland USA /1997 | Research | 472 | **151800**<br>226560 | 61000<br>22600 |
| 13 | Intel<br>XP/S140 | Sandia National Labs<br>Albuquerque USA /1993 | Research | 3680 | **143400**<br>184000 | 55700<br>20500 |
| 14 | SGI/Cray<br>T3E900 LC256-512 | Minnesota Supercomputer Center<br>USA /1997 | Academic | 256 | **138700**<br>230400 | 81920<br>10192 |
| 15 | SGI/Cray<br>T3E900 LC256-256 | Naval Oceanographic Office (NAVOCEANO)<br>Bay Saint Louis USA /1997 | Research<br>Weather | 256 | **138700**<br>230400 | 81920<br>10192 |
| 16 | Intel<br>XP/S-MP 150 | Oak Ridge National Laboratory<br>Oak Ridge USA /1995 | Research | 3072 | **127100**<br>154000 | 86000<br>17800 |
| 17 | SGI/Cray<br>T3E750 LC256-128 | Commissariat a l'Energie Atomique (CEA)<br>Grenoble France /1997 | Research<br>Energy | 256 | **115500**<br>192000 | .<br>. |
| 18 | Fujitsu<br>VPP700/56 | Kyushu University<br>Fukuoka Japan /1996 | Academic | 56 | **110300**<br>123200 | 109200<br>10752 |
| 19 | Fujitsu<br>VPP500/80 | National Lab. for High Energy Physics<br>Japan /1994 | Research | 80 | **109800**<br>128000 | 46400<br>11030 |
| 20 | Intel<br>XP/S-MP 125 | Japan Atomic Energy Research<br>Japan /1996 | Research | 2502 | **103500**<br>125100 | .<br>. |



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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>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 21 | SGI/Cray<br>T3D MC1024-8 | Government<br>USA /1994 | Classified | 1024 | **100500**<br>152000 | 81920<br>10224 |
| 22 | Fujitsu<br>VPP700/46 | ECMWF<br>Reading UK /1996 | Research<br>Weather | 46 | **94300**<br>101200 | 100280<br>8280 |
| 23 | SGI/Cray<br>T3E LC256-128 | CNRS/IDRIS<br>Orsay France /1996 | Research | 256 | **93200**<br>154000 | 53664<br>11040 |
| 24 | SGI/Cray<br>T3E LC256-128 | Cray Research<br>Eagan USA /1997 | Vendor | 256 | **93200**<br>154000 | 53664<br>11040 |
| 25 | SGI/Cray<br>T3E LC256-128 | DOD/CEWES<br>Vicksburg USA /1996 | Research<br>Mechanics | 256 | **93200**<br>154000 | 53664<br>11040 |
| 26 | SGI/Cray<br>T3E LC256-128 | UCSD/San Diego Supercomputer Center<br>San Diego USA /1996 | Academic | 256 | **93200**<br>154000 | 53664<br>11040 |
| 27 | IBM<br>SP2/512 | Cornell Theory Center<br>Ithaca USA /1994 | Academic | 512 | **88400**<br>136000 | 73500<br>20150 |
| 28 | SGI/Cray<br>T3E750 LC192-128 | CSC (Center for Scientific Computing)<br>Espoo Finland /1996 | Academic | 192 | **86600**<br>144000 | .<br>. |
| 29 | IBM<br>SP2 P2 135MHz/256 | DOD/CEWES<br>Vicksburg USA /1997 | Industry | 256 | **83370**<br>138240 | .<br>. |
| 30 | IBM<br>SP2 P2 135MHz/256 | Wright-Patterson Air Force Base<br>USA /1997 | Research | 256 | **83370**<br>138240 | .<br>. |
| 31 | IBM<br>SP2 P2 120MHz/256 | IBM/Poughkeepsie<br>Poughkeepsie USA /1997 | Vendor | 256 | **83370**<br>122880 | .<br>. |
| 32 | SGI/Cray<br>T3E LC200-128 | ARPA<br>USA /1997 | Academic | 200 | **74480**<br>120000 | .<br>. |
| 33 | Fujitsu/SNI<br>VPP700/34 | Leibniz Rechenzentrum<br>Muenchen Germany /1997 | Academic | 34 | **71150**<br>74800 | .<br>. |
| 34 | SGI/Cray<br>T3E900 LC128-128 | KIST/System Engineering Research Institute (SSC)<br>Korea /1997 | Research | 128 | **69300**<br>115200 | 57344<br>7040 |
| 35 | SGI/Cray<br>T3E900 LC128-128 | University of Edinburgh<br>Edinburgh UK /1997 | Academic | 128 | **69300**<br>115200 | 57344<br>7040 |
| 36 | IBM<br>SP2/384 | Maui High-Performance Computing Center (MHPCC)<br>USA /1994 | Research | 384 | **66300**<br>102400 | .<br>. |
| 37 | SGI/Cray<br>T3E750 LC136-128 | ZIB/Konrad Zuse-Zentrum fuer Informationstechnik<br>Berlin Germany /1997 | Academic | 136 | **61300**<br>102000 | .<br>. |
| 38 | SGI/Cray<br>T3E LC160-256 | NERSC/LBNL<br>Berkley USA /1997 | Research | 160 | **61120**<br>96000 | .<br>. |
| 39 | NEC<br>SX-4/32 | NEC Fuchu Plant<br>Tokyo Japan /1995 | Vendor<br>Benchmarking | 32 | **60650**<br>64000 | 10000<br>1560 |
| 40 | NEC<br>SX-4/32 | National Institute for Environmental Studies<br>Tsukuba Japan /1997 | Research<br>Environment | 32 | **60650**<br>64000 | 10000<br>1560 |

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|---|---|---|---|---|---|---|
| 41 | NEC<br>SX-4/32 | Osaka University<br>Osaka Japan /1996 | Academic | 32 | **60650**<br>64000 | 10000<br>1560 |
| 42 | NEC<br>SX-4/32 | Osaka University<br>Osaka Japan /1996 | Academic | 32 | **60650**<br>64000 | 10000<br>1560 |
| 43 | NEC<br>SX-4/32 | Universitaet Stuttgart<br>Stuttgart Germany /1996 | Research | 32 | **60650**<br>64000 | 10000<br>1560 |
| 44 | TMC<br>CM-5/1056 | Los Alamos National Laboratory<br>Los Alamos USA /1993 | Research<br>Energy | 1056 | **59700**<br>135100 | 52224<br>24064 |
| 45 | Fujitsu<br>VPP500/42 | Japan Atomic Energy Research<br>Japan /1994 | Research | 42 | **59600**<br>67200 | .<br>. |
| 46 | Fujitsu<br>VPP500/42 | Nagoya University<br>Nagoya Japan /1995 | Academic | 42 | **59600**<br>67200 | .<br>. |
| 47 | Hitachi<br>SR2201/256 | Real World Computing (RWCP)<br>Tokyo Japan /1997 | Research | 256 | **58680**<br>77000 | 77760<br>13440 |
| 48 | Fujitsu<br>VPP500/40 | National Institute of Genetics<br>Mishima Japan /1995 | Research | 40 | **56900**<br>64000 | .<br>. |
| 49 | Fujitsu<br>VPP500/40 | Tokyo University - Inst. of Solid State Physics<br>Tokyo Japan /1994 | Academic | 40 | **56900**<br>64000 | .<br>. |
| 50 | SGI/Cray<br>T3E LC184-128 | National Supercomputer Centre (NSC)<br>Linkoping Sweden /1996 | Academic | 184 | **55770**<br>110400 | .<br>. |
| 51 | SGI/Cray<br>T3E LC136-128 | Commissariat a l'Energie Atomique (CEA)<br>Limeil France /1996 | Research | 136 | **53100**<br>81800 | .<br>. |
| 52 | TMC<br>CM-5/896 | Minnesota Supercomputer Center<br>USA /1994 | Academic | 896 | **52300**<br>114700 | .<br>. |
| 53 | SGI/Cray<br>T3D MC512-8 | Los Alamos National Laboratory<br>Los Alamos USA /1994 | Research<br>Energy | 512 | **50800**<br>76000 | 57856<br>7136 |
| 54 | SGI/Cray<br>T3D MC512-8 | Minnesota Supercomputer Center<br>USA /1995 | Academic | 512 | **50800**<br>76000 | 57856<br>7136 |
| 55 | SGI/Cray<br>T3D MC512-8 | Pittsburgh Supercomputing Center<br>Pittsburgh USA /1994 | Academic | 512 | **50800**<br>76000 | 57856<br>7136 |
| 56 | SGI/Cray<br>T3D MC512-8 | University of Edinburgh<br>Edinburgh UK /1996 | Academic | 512 | **50800**<br>76000 | 57856<br>7136 |
| 57 | SGI/Cray<br>T3E LC128-128 | CINECA<br>Bologna Italy /1996 | Research | 128 | **50430**<br>77000 | 58848<br>7392 |
| 58 | SGI/Cray<br>T3E AC128-64 | Japan Adv. Inst. of Science and Technology (JAIST)<br>Hokuriku Japan /1997 | Academic | 128 | **50430**<br>77000 | 58848<br>7392 |
| 59 | SGI/Cray<br>T3E LC128-128 | NRI for Earth Science and Disaster (NIED)<br>Japan /1997 | Research | 128 | **50430**<br>77000 | 58848<br>7392 |
| 60 | NEC<br>SX-4/25 | NAL<br>Japan /1997 | Research | 25 | **47550**<br>50000 | .<br>. |

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|---|---|---|---|---|---|---|
| 61 | Fujitsu<br>VPP500/32 | The Angstrom Technology Partnership<br>Tsukuba Japan /1993 | Research | 32 | **46100**<br>51200 | 29760<br>5350 |
| 62 | IBM<br>SP2/256 | Lawrence Livermore National Laboratory<br>Livermore USA /1996 | Research<br>Energy | 256 | **44200**<br>68000 | 53000<br>13500 |
| 63 | IBM<br>SP2/256 | Lawrence Livermore National Laboratory<br>Livermore USA /1996 | Research<br>Energy | 256 | **44200**<br>68000 | 53000<br>13500 |
| 64 | IBM<br>SP2/256 | Universitaet/Forschungszentrum Karlsruhe<br>Karlsruhe Germany /1997 | Academic | 256 | **44200**<br>68000 | 53000<br>13500 |
| 65 | Fujitsu<br>VPP500/28 | Institute of Physical and Chemical Res. (RIKEN)<br>Tokyo Japan /1993 | Research | 28 | **40475**<br>44800 | .<br>. |
| 66 | NEC<br>SX-4/20 | Japan Marine Science and Technology<br>Yokosuka Japan /1995 | Research | 20 | **38195**<br>40000 | .<br>. |
| 67 | NEC<br>SX-4/20 | National Research Institute for Metals<br>Tsukuba Japan /1996 | Research | 20 | **38195**<br>40000 | .<br>. |
| 68 | NEC<br>SX-4/20 | Toyota Central Research Development<br>Japan /1996 | Industry<br>Automotive | 20 | **38195**<br>40000 | .<br>. |
| 69 | SGI/Cray<br>T3E900 AC64-128 | Phillips Petroleum Company<br>Bartlesville USA /1997 | Industry<br>Geophysics | 64 | **34800**<br>57600 | 40960<br>4992 |
| 70 | SGI/Cray<br>T3E AC88-128 | Norwegian University of Science and Technology<br>Trondheim Norway /1997 | Academic | 88 | **34650**<br>52800 | .<br>. |
| 71 | SGI/Cray<br>T3E LC88-128 | University of Alaska - ARSC<br>Fairbanks USA /1997 | Academic | 88 | **34650**<br>52800 | .<br>. |
| 72 | Fujitsu<br>VPP300/16 | Japan Atomic Energy Research<br>Japan /1996 | Research | 16 | **34100**<br>35200 | 59200<br>3520 |
| 73 | Fujitsu<br>VPP300/16 | Japan Science and Technology<br>Tokyo Japan /1996 | Research | 16 | **34100**<br>35200 | 59200<br>3520 |
| 74 | Fujitsu<br>VPP300/16 | Reactor Nuclear Fuel Development<br>Japan /1996 | Research | 16 | **34100**<br>35200 | 59200<br>3520 |
| 75 | Fujitsu/SNI<br>VPP300/16 | Universitaet/Forschungszentrum Karlsruhe<br>Karlsruhe Germany /1997 | Academic | 16 | **34100**<br>35200 | 59200<br>3520 |
| 76 | Intel<br>XP/S-MP 41 | Rome Laboratory<br>USA /1995 | Research | 816 | **33700**<br>40800 | .<br>. |
| 77 | IBM<br>SP2 P2 120MHz/94 | Argonne National Laboratory<br>USA /1996 | Research | 94 | **32680**<br>45120 | .<br>. |
| 78 | SGI/Cray<br>T3E AC80-64 | The Scripps Research Institute<br>La Jolla USA /1997 | Research | 80 | **31500**<br>48000 | .<br>. |
| 79 | NEC<br>SX-4/16 | Atmospheric Environment Service (AES)<br>Dorval Canada /1995 | Research<br>Weather | 16 | **30710**<br>32000 | 10000<br>890 |
| 80 | NEC<br>SX-4/16 | Danish Meteorological Institute<br>Copenhagen Denmark /1997 | Research | 16 | **30710**<br>32000 | 10000<br>890 |

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|---|---|---|---|---|---|---|
| 81 | NEC<br>SX-4/16 | National Aerospace Laboratory (NLR)<br>Noordoostpolder Netherlands /1996 | Research<br>Aerospace | 16 | **30710**<br>32000 | 10000<br>890 |
| 82 | NEC<br>SX-4/16 | National Cardiovascular Center<br>Japan /1996 | Research | 16 | **30710**<br>32000 | 10000<br>890 |
| 83 | NEC<br>SX-4/16 | Swiss Scientific Computing Center (CSCS)<br>Manno Switzerland /1996 | Research | 16 | **30710**<br>32000 | 10000<br>890 |
| 84 | TMC<br>CM-5/512 | National Security Agency<br>USA /1993 | Classified | 512 | **30400**<br>66000 | 36864<br>16384 |
| 85 | SGI/Cray<br>Y-MP T932/321024 | Government<br>USA /1996 | Classified | 32 | **29360**<br>58000 | .<br>. |
| 86 | SGI/Cray<br>Y-MP T932/321024 | Government<br>USA /1997 | Classified | 32 | **29360**<br>58000 | .<br>. |
| 87 | SGI/Cray<br>Y-MP T932/321024 | NRI for Earth Science and Disaster (NIED)<br>Japan /1997 | Research | 32 | **29360**<br>58000 | .<br>. |
| 88 | SGI/Cray<br>Y-MP T932/321024 | Nippon Telegraph and Telephone (NTT)<br>Tokyo Japan /1995 | Industry<br>Finance | 32 | **29360**<br>58000 | .<br>. |
| 89 | IBM<br>SP2/160 | NASA/Ames Research Center/NAS<br>Moffett Field USA /1994 | Research | 160 | **28700**<br>42500 | 42200<br>10300 |
| 90 | Hitachi<br>S-3800/480 | Hitachi Ltd. GPCD<br>Japan /1994 | Vendor<br>Software | 4 | **28400**<br>32000 | 15500<br>830 |
| 91 | Hitachi<br>S-3800/480 | Japan Meteorological Agency<br>Japan /1995 | Research<br>Weather | 4 | **28400**<br>32000 | 15500<br>830 |
| 92 | Hitachi<br>S-3800/480 | University of Tokyo<br>Tokyo Japan /1993 | Academic | 4 | **28400**<br>32000 | 15500<br>830 |
| 93 | Fujitsu<br>VPP300/13 | Australian National University<br>Canberra Australia /1996 | Academic | 13 | **27720**<br>28600 | .<br>. |
| 94 | SGI/Cray<br>Y-MP T932/241024 | Ford Motor Company<br>Dearborn USA /1996 | Industry<br>Automotive | 24 | **26170**<br>43500 | .<br>. |
| 95 | Fujitsu<br>VPP300/12 | Japan Atomic Energy Research<br>Japan /1996 | Research | 12 | **25600**<br>26400 | .<br>. |
| 96 | SGI/Cray<br>T3D MC256-8/464 | Bear Stearns<br>USA /1996 | Industry<br>Finance | 256 | **25300**<br>38000 | 40960<br>4918 |
| 97 | SGI/Cray<br>T3D SC256-8/264 | Caltech/JPL<br>Pasadena USA /1994 | Research | 256 | **25300**<br>38000 | 40960<br>4918 |
| 98 | SGI/Cray<br>T3D MC256-8 | Defense Research Agency<br>Farnborough UK /1994 | Classified | 256 | **25300**<br>38000 | 40960<br>4918 |
| 99 | SGI/Cray<br>T3D MC256-8 | EXXON<br>USA /1995 | Industry<br>Geophysics | 256 | **25300**<br>38000 | 40960<br>4918 |
| 100 | SGI/Cray<br>T3D MC256-8 | Ecole Polytechnique Federale de Lausanne<br>Lausanne Switzerland /1994 | Academic | 256 | **25300**<br>38000 | 40960<br>4918 |

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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>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 101 | SGI/Cray<br>T3D SC256-8/364 | Lawrence Livermore National Laboratory<br>Livermore USA /1994 | Research<br>Energy | 256 | **25300**<br>38000 | 40960<br>4918 |
| 102 | SGI/Cray<br>T3D SC256-8/464 | ZIB/Konrad Zuse-Zentrum fuer Informationstechnik<br>Berlin Germany /1995 | Academic | 256 | **25300**<br>38000 | 40960<br>4918 |
| 103 | SGI/Cray<br>T3E LC64-128 | Cray Research<br>USA /1996 | Vendor | 64 | **25190**<br>38000 | 39936<br>4896 |
| 104 | SGI/Cray<br>T3E AC64-128 | EDS/General Motors<br>Auburn Hills USA /1996 | Industry<br>Automotive | 64 | **25190**<br>38000 | 39936<br>4896 |
| 105 | SGI/Cray<br>T3E AC64-128 | Minnesota Supercomputer Center<br>USA /1997 | Academic | 64 | **25190**<br>38000 | 39936<br>4896 |
| 106 | SGI/Cray<br>T3E AC64-128 | Technical University Delft (TUD)<br>Delft Netherlands /1996 | Academic | 64 | **25190**<br>38000 | 39936<br>4896 |
| 107 | Digital<br>AlphaServer 8400 5/440 | Lawrence Livermore National Laboratory<br>Livermore USA /1996 | Research | 80 | **24700**<br>70400 | 30712<br>4584 |
| 108 | Digital<br>AlphaServer 8400 5/440 | Digital Equipment Corporation<br>Maynard USA /1997 | Vendor<br>Benchmarking | 64 | **24700**<br>56300 | 30712<br>4584 |
| 109 | Fujitsu<br>VPP500/16 | Reactor Nuclear Fuel Development<br>Japan /1996 | Research | 16 | **23600**<br>25600 | 21120<br>3360 |
| 110 | NEC<br>SX-3/44R | Atmospheric Environment Service (AES)<br>Dorval Canada /1994 | Research<br>Weather | 4 | **23200**<br>26000 | 6400<br>830 |
| 111 | NEC<br>SX-3/44R | Tohoku University<br>Aramaki Japan /1993 | Academic | 4 | **23200**<br>26000 | 6400<br>830 |
| 112 | SGI/Cray<br>Y-MP T932/20512 | NOAA/Geophysical Fluid Dynamics Laboratory (GFDL)<br>Princeton USA /1996 | Research<br>Weather | 20 | **23075**<br>36250 | .<br>. |
| 113 | Hitachi<br>SR2201/96 | University of Cambridge<br>Cambridge UK /1997 | Academic | 96 | **22180**<br>28800 | .<br>. |
| 114 | Fujitsu<br>VPP500/15 | Kyoto University<br>Kyoto Japan /1994 | Academic | 15 | **22150**<br>24000 | .<br>. |
| 115 | SGI/Cray<br>T3E900 AC40-128 | NOAA/Geophysical Fluid Dynamics Laboratory (GFDL)<br>Princeton USA /1997 | Research<br>Weather | 40 | **21750**<br>36000 | .<br>. |
| 116 | SGI/Cray<br>T3E900 AC40-128 | Universitaet Rostock<br>Germany /1997 | Academic | 40 | **21750**<br>36000 | .<br>. |
| 117 | Hitachi<br>S-3800/380 | Hokkaido University<br>Sapporo Japan /1994 | Academic | 3 | **21600**<br>24000 | 15680<br>760 |
| 118 | Hitachi<br>S-3800/380 | Institute for Materials Research/Tohoku University<br>Japan /1994 | Academic | 3 | **21600**<br>24000 | 15680<br>760 |
| 119 | Sun<br>Ultra HPC 10000 | ATT<br>USA /1997 | Industry | 64 | **21370**<br>32000 | 15000<br>4200 |
| 120 | Sun<br>Ultra HPC 10000 | ATT<br>USA /1997 | Industry | 64 | **21370**<br>32000 | 15000<br>4200 |

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|---|---|---|---|---|---|---|
| 121 | Sun<br>Ultra HPC 10000 | ATT<br>USA /1997 | Industry | 64 | **21370**<br>32000 | 15000<br>4200 |
| 122 | Sun<br>Ultra HPC 10000 | Allstate Insurance<br>Chicago USA /1997 | Industry<br>Database | 64 | **21370**<br>32000 | 15000<br>4200 |
| 123 | Sun<br>Ultra HPC 10000 | Sun<br>San Diego USA /1997 | Vendor | 64 | **21370**<br>32000 | 15000<br>4200 |
| 124 | Sun<br>Ultra HPC 10000 | Sun<br>San Diego USA /1997 | Vendor | 64 | **21370**<br>32000 | 15000<br>4200 |
| 125 | Sun<br>Ultra HPC 10000 | University of Tokyo<br>Tokyo Japan /1997 | Academic | 64 | **21370**<br>32000 | 15000<br>4200 |
| 126 | SGI/Cray<br>T3E AC52-128 | AWI (Alfred Wegener Institut)<br>Bremerhaven Germany /1996 | Research | 52 | **20430**<br>31200 | .<br>. |
| 127 | IBM<br>SP2/110 | KTH - Royal Institute of Technology<br>Stockholm Sweden /1996 | Research | 110 | **20370**<br>29210 | .<br>. |
| 128 | NEC<br>SX-3/44 | Atmospheric Environment Service (AES)<br>Dorval Canada /1991 | Research<br>Weather | 4 | **20000**<br>22000 | 6144<br>832 |
| 129 | IBM<br>SP2 P2 120MHz/56 | Chase Manhatten<br>New York USA /1997 | Industry<br>Database | 56 | **19750**<br>26880 | .<br>. |
| 130 | IBM<br>SP2/104 | MCI<br>USA /1994 | Industry<br>Database | 104 | **19340**<br>27620 | .<br>. |
| 131 | SGI/Cray<br>ORIGIN 2000 | Cray Research<br>Eagan USA /1997 | Vendor | 64 | **19230**<br>24960 | 32000<br>6000 |
| 132 | SGI/Cray<br>ORIGIN 2000 | Cray Research<br>Eagan USA /1997 | Vendor | 64 | **19230**<br>24960 | 32000<br>6000 |
| 133 | SGI/Cray<br>ORIGIN 2000 | INRIA - Sophia Antipolis<br>Rennes France /1997 | Research | 64 | **19230**<br>24960 | 32000<br>6000 |
| 134 | SGI/Cray<br>ORIGIN 2000 | Indiana University<br>Bloomington USA /1997 | Academic | 64 | **19230**<br>24960 | 32000<br>6000 |
| 135 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 64 | **19230**<br>24960 | 32000<br>6000 |
| 136 | SGI/Cray<br>ORIGIN 2000 | NCSA<br>Urbana-Champaign USA /1997 | Research | 64 | **19230**<br>24960 | 32000<br>6000 |
| 137 | SGI/Cray<br>ORIGIN 2000 | NCSA<br>Urbana-Champaign USA /1997 | Research | 64 | **19230**<br>24960 | 32000<br>6000 |
| 138 | SGI/Cray<br>ORIGIN 2000 | Naval Research Laboratory (NRL)<br>Washington D.C. USA /1996 | Research | 64 | **19230**<br>24960 | 32000<br>6000 |
| 139 | SGI/Cray<br>ORIGIN 2000 | Oracle Corporation<br>Redwood Shores USA /1997 | Industry<br>Database | 64 | **19230**<br>24960 | 32000<br>6000 |
| 140 | SGI/Cray<br>ORIGIN 2000 | Oracle Corporation<br>Redwood Shores USA /1997 | Industry<br>Database | 64 | **19230**<br>24960 | 32000<br>6000 |

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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 | SGI/Cray<br>ORIGIN 2000 | Silicon Graphics<br>Mountain View USA /1997 | Vendor<br>Software | 64 | **19230**<br>24960 | 32000<br>6000 |
| 142 | SGI/Cray<br>ORIGIN 2000 | Silicon Graphics<br>Mountain View USA /1997 | Vendor<br>Software | 64 | **19230**<br>24960 | 32000<br>6000 |
| 143 | Fujitsu<br>VPP300/9 | ECMWF<br>Reading UK /1997 | Research<br>Weather | 9 | **19225**<br>19800 | .<br>. |
| 144 | SGI/Cray<br>T3E AC48-128 | Mobil / Technical Center<br>Tulsa USA /1997 | Industry<br>Geophysics | 48 | **18840**<br>28800 | .<br>. |
| 145 | Intel<br>XP/S-MP 22 | ETH<br>Zuerich Switzerland /1995 | Academic | 450 | **18700**<br>22500 | .<br>. |
| 146 | SGI/Cray<br>POWER CHALLENGEarray | US Army Research Laboratory<br>Aberdeen USA /1995 | Research | 96 | **18455**<br>28800 | 53000<br>20000 |
| 147 | IBM<br>SP2/98 | Citicorp<br>USA /1996 | Industry<br>Finance | 98 | **18310**<br>26030 | .<br>. |
| 148 | IBM<br>SP2 P2 120MHz/51 | Maui High-Performance Computing Center (MHPCC)<br>USA /1997 | Research | 51 | **18010**<br>24480 | .<br>. |
| 149 | SGI/Cray<br>T3E900 AC32-64 | MIT/Lincoln Laboratory<br>USA /1997 | Academic | 32 | **17400**<br>28800 | 28672<br>3200 |
| 150 | NEC<br>SX-3/34R | National Inst. for Molecular Science<br>Okozaki Japan /1993 | Research | 3 | **17400**<br>19500 | 6144<br>691 |
| 151 | NEC<br>SX-3/34R | VW (Volkswagen AG)<br>Wolfsburg Germany /1996 | Industry<br>Automotive | 3 | **17400**<br>19500 | 6144<br>691 |
| 152 | Fujitsu<br>VPP300/8 | Nippon University<br>Japan /1996 | Academic | 8 | **17100**<br>17600 | 41600<br>2080 |
| 153 | Fujitsu/SNI<br>VPP300/8 | Universitaet Aachen<br>Aachen Germany /1996 | Academic | 8 | **17100**<br>17600 | 41600<br>2080 |
| 154 | Sun<br>Ultra HPC 10000 | Ministry of the Interior<br>Seoul Korea /1997 | Classified | 48 | **16600**<br>24000 | 15000<br>3600 |
| 155 | Sun<br>Ultra HPC 10000 | Ministry of the Interior<br>Seoul Korea /1997 | Classified | 48 | **16600**<br>24000 | 15000<br>3600 |
| 156 | Sun<br>Ultra HPC 10000 | National Reserve Bank<br>Moscow Russian Federation/1997 | Industry | 48 | **16600**<br>24000 | 15000<br>3600 |
| 157 | Sun<br>Ultra HPC 10000 | Oracle Corporation<br>Redwood Shores USA /1997 | Industry<br>Database | 48 | **16600**<br>24000 | 15000<br>3600 |
| 158 | Sun<br>Ultra HPC 10000 | Oracle Corporation<br>Redwood Shores USA /1997 | Industry<br>Database | 48 | **16600**<br>24000 | 15000<br>3600 |
| 159 | Sun<br>Ultra HPC 10000 | Toshiba<br>Tokyo Japan /1997 | Industry | 48 | **16600**<br>24000 | 15000<br>3600 |
| 160 | IBM<br>SP2/85 | NIH (National Institute of Health)<br>Frederick USA /1995 | Research | 85 | **16090**<br>22570 | .<br>. |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 161 | SGI/Cray<br>T3E AC40-128 | University of Texas<br>Austin USA /1996 | Academic | 40 | **15670**<br>24000 | .<br>. |
| 162 | SGI/Cray<br>POWER CHALLENGEarray | NCSA<br>Urbana-Champaign USA /1996 | Research | 64 | **15598**<br>23040 | 37000<br>8500 |
| 163 | SGI/Cray<br>Y-MP T916/12512 | Forschungszentrum Juelich (FZJ)<br>Juelich Germany /1996 | Research | 12 | **15430**<br>21750 | .<br>. |
| 164 | NEC<br>SX-4/8 | ATR Optical Communication Lab<br>Japan /1996 | Research | 8 | **15350**<br>16000 | .<br>. |
| 165 | NEC<br>SX-4/8 | German Aerospace Laboratory (DLR)<br>Goettingen Germany /1996 | Research<br>Aerospace | 8 | **15350**<br>16000 | .<br>. |
| 166 | NEC<br>SX-4/8 | National Geographic Agency<br>Japan /1996 | Research | 8 | **15350**<br>16000 | .<br>. |
| 167 | IBM<br>SP2/80 | National Center for High Performance Computing<br>Taiwan /1996 | Academic | 80 | **15230**<br>21250 | .<br>. |
| 168 | Intel<br>XP/S35 | Caltech<br>Pasadena USA /1994 | Research | 512 | **15200**<br>26000 | 23000<br>9000 |
| 169 | Intel<br>XP/S35 | Oak Ridge National Laboratory<br>Oak Ridge USA /1992 | Research | 512 | **15200**<br>26000 | 23000<br>9000 |
| 170 | TMC<br>CM-5/256 | Geco-Prakla<br>Houston USA /1994 | Industry<br>Geophysics | 256 | **15100**<br>33000 | 26112<br>12032 |
| 171 | TMC<br>CM-5/256 | Geco-Prakla<br>Houston USA /1995 | Industry<br>Geophysics | 256 | **15100**<br>33000 | 26112<br>12032 |
| 172 | TMC<br>CM-5/256 | Naval Research Laboratory (NRL)<br>Washington D.C. USA /1992 | Research | 256 | **15100**<br>33000 | 26112<br>12032 |
| 173 | IBM<br>SP2/79 | CNUSC<br>Montpellier France /1996 | Academic | 79 | **15060**<br>20980 | .<br>. |
| 174 | Hewlett-Packard<br>Exemplar X-Class | Caltech/JPL<br>Pasadena USA /1997 | Research | 64 | **15010**<br>64000 | 26848<br>1840 |
| 175 | Hewlett-Packard<br>Exemplar X-Class | Caltech/JPL<br>Pasadena USA /1997 | Research | 64 | **15010**<br>64000 | 26848<br>1840 |
| 176 | Hewlett-Packard<br>Exemplar X-Class | Caltech/JPL<br>Pasadena USA /1997 | Research | 64 | **15010**<br>64000 | 26848<br>1840 |
| 177 | Hewlett-Packard<br>Exemplar X-Class | Caltech/JPL<br>Pasadena USA /1997 | Research | 64 | **15010**<br>64000 | 26848<br>1840 |
| 178 | Hewlett-Packard<br>Exemplar X-Class | Hewlett-Packard CXTC<br>Richardson USA /1997 | Vendor<br>Benchmarking | 64 | **15010**<br>64000 | 26848<br>1840 |
| 179 | Hewlett-Packard<br>Exemplar X-Class | NCSA<br>Urbana-Champaign USA /1997 | Academic | 64 | **15010**<br>64000 | 26848<br>1840 |
| 180 | Hewlett-Packard<br>Exemplar X-Class | Naval Research Laboratory (NRL)<br>Washington D.C. USA /1997 | Classified | 64 | **15010**<br>64000 | 26848<br>1840 |

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| **N** *world* | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | $\mathbf{R_{max}}$ $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 181 | Hewlett-Packard Exemplar X-Class | Hilti Schaan Liechtenstein /1997 | Industry | 32 | **15010** 32000 | 26848 1840 |
| 182 | Hewlett-Packard Exemplar X-Class | Universitaet Leipzig Leipzig Germany /1996 | Academic | 32 | **15010** 32000 | 26848 1840 |
| 183 | IBM SP2/78 | DKFZ Heidelberg Germany /1996 | Research | 78 | **14890** 20710 | . . |
| 184 | Hitachi SR2201/64 | Hitachi RCS Ebina Japan /1996 | Vendor | 64 | **14890** 19000 | 38880 6720 |
| 185 | Hitachi SR2201/64 | Japan Atomic Energy Research Japan /1996 | Research | 64 | **14890** 19000 | 38880 6720 |
| 186 | Hitachi SR2201/64 | Suzuki Motor Japan /1997 | Industry Automotive | 64 | **14890** 19000 | 38880 6720 |
| 187 | IBM SP2/77 | Leibniz Rechenzentrum Muenchen Germany /1995 | Academic | 77 | **14720** 20450 | . . |
| 188 | IBM SP2/77 | Sears Product Service Group USA /1996 | Industry Database | 77 | **14720** 20450 | . . |
| 189 | IBM SP2/77 | Sears Roebuck USA /1996 | Industry Database | 77 | **14720** 20450 | . . |
| 190 | Hitachi S-3800/280 | Central Res. Inst. of Electric Power Ind. Japan /1996 | Research | 2 | **14600** 16000 | 15680 570 |
| 191 | IBM SP2/76 | SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1995 | Research | 76 | **14550** 20180 | . . |
| 192 | IBM SP2/75 | Atomic Weapons Establishment Aldermaston UK /1996 | Classified | 75 | **14380** 19920 | . . |
| 193 | Sun Ultra HPC 10000 | Enron Capital Houston USA /1997 | Industry | 40 | **14060** 20000 | 15000 3000 |
| 194 | Sun Ultra HPC 10000 | Universitaet Koeln Koeln Germany /1997 | Academic | 40 | **14060** 20000 | 15000 3000 |
| 195 | Intel Delta | Caltech Pasadena USA /1991 | Academic | 512 | **13900** 20480 | 25000 7500 |
| 196 | IBM SP2/72 | Nuclear Power Engineering Japan /1995 | Industry Energy | 72 | **13860** 19120 | . . |
| 197 | SGI/Cray Y-MP C916/16512 | Cray Research Eagan USA /1992 | Vendor | 16 | **13700** 15238 | 10000 650 |
| 198 | SGI/Cray Y-MP C916/16256 | DKRZ Hamburg Germany /1995 | Research Weather | 16 | **13700** 15238 | 10000 650 |
| 199 | SGI/Cray Y-MP C916/161024 | DOD/CEWES Vicksburg USA /1994 | Research Mechanics | 16 | **13700** 15238 | 10000 650 |
| 200 | SGI/Cray Y-MP C916/16256 | DOE/Bettis Atomic Power Laboratory USA /1993 | Research | 16 | **13700** 15238 | 10000 650 |

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|---|---|---|---|---|---|---|
| 201 | SGI/Cray<br>Y-MP C916/16256 | DOE/Knolls Atomic Power Laboratory<br>USA /1993 | Research | 16 | **13700**<br>15238 | 10000<br>650 |
| 202 | SGI/Cray<br>Y-MP C916/16256 | ECMWF<br>Reading UK /1994 | Research<br>Weather | 16 | **13700**<br>15238 | 10000<br>650 |
| 203 | SGI/Cray<br>Y-MP C916/16512 | Ford Motor Company<br>Dearborn USA /1993 | Industry<br>Automotive | 16 | **13700**<br>15238 | 10000<br>650 |
| 204 | SGI/Cray<br>Y-MP C916/16512 | Ford Motor Company<br>Dearborn USA /1995 | Industry<br>Automotive | 16 | **13700**<br>15238 | 10000<br>650 |
| 205 | SGI/Cray<br>Y-MP C916/161024 | Government<br>USA /1992 | Classified | 16 | **13700**<br>15238 | 10000<br>650 |
| 206 | SGI/Cray<br>Y-MP C916/161024 | Government<br>USA /1992 | Classified | 16 | **13700**<br>15238 | 10000<br>650 |
| 207 | SGI/Cray<br>Y-MP C916/161024 | Government<br>USA /1992 | Classified | 16 | **13700**<br>15238 | 10000<br>650 |
| 208 | SGI/Cray<br>Y-MP C916/161024 | Government<br>USA /1992 | Classified | 16 | **13700**<br>15238 | 10000<br>650 |
| 209 | SGI/Cray<br>Y-MP C916/16512 | Government<br>USA /1994 | Classified | 16 | **13700**<br>15238 | 10000<br>650 |
| 210 | SGI/Cray<br>Y-MP C916/16256 | Government Communications Headquarters<br>Benhall UK /1994 | Classified | 16 | **13700**<br>15238 | 10000<br>650 |
| 211 | SGI/Cray<br>Y-MP C916/16512 | KIST/System Engineering Research Institute (SSC)<br>Korea /1993 | Academic | 16 | **13700**<br>15238 | 10000<br>650 |
| 212 | SGI/Cray<br>Y-MP C916/161024 | MITI - AIST - RIPS<br>Tsukuba Japan /1994 | Research | 16 | **13700**<br>15238 | 10000<br>650 |
| 213 | SGI/Cray<br>Y-MP C916/161024 | NASA/Ames Research Center/NAS<br>Moffett Field USA /1993 | Research | 16 | **13700**<br>15238 | 10000<br>650 |
| 214 | SGI/Cray<br>Y-MP C916/16256 | NERSC/LBNL<br>Berkley USA /1992 | Research | 16 | **13700**<br>15238 | 10000<br>650 |
| 215 | SGI/Cray<br>Y-MP C916/16256 | NOAA/Geophysical Fluid Dynamics Laboratory (GFDL)<br>Princeton USA /1995 | Research<br>Weather | 16 | **13700**<br>15238 | 10000<br>650 |
| 216 | SGI/Cray<br>Y-MP C916/16256 | NOAA/National Centers for Environment Prediction<br>Suitland USA /1994 | Research | 16 | **13700**<br>15238 | 10000<br>650 |
| 217 | SGI/Cray<br>Y-MP C916/16512 | National Security Agency<br>USA /1994 | Classified | 16 | **13700**<br>15238 | 10000<br>650 |
| 218 | SGI/Cray<br>Y-MP C916/161024 | Naval Oceanographic Office (NAVOCEANO)<br>Bay Saint Louis USA /1994 | Research<br>Weather | 16 | **13700**<br>15238 | 10000<br>650 |
| 219 | SGI/Cray<br>Y-MP C916/16512 | Pittsburgh Supercomputing Center<br>Pittsburgh USA /1994 | Academic | 16 | **13700**<br>15238 | 10000<br>650 |
| 220 | SGI/Cray<br>Y-MP C916/161024 | Tohoku University, Institute of Fluid Science<br>Aramaki Japan /1994 | Academic | 16 | **13700**<br>15238 | 10000<br>650 |

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|---|---|---|---|---|---|---|
| 221 | SGI/Cray<br>Y-MP C916/161024 | Wright-Patterson Air Force Base<br>USA /1996 | Research | 16 | **13700**<br>15238 | 10000<br>650 |
| 222 | IBM<br>SP2/69 | PIK<br>Potsdam Germany /1996 | Research | 69 | **13350**<br>18320 | .<br>. |
| 223 | IBM<br>SP2/68 | DLR<br>Koeln Germany /1996 | Research | 68 | **13180**<br>18060 | .<br>. |
| 224 | SGI/Cray<br>Y-MP T932/101024 | EDS/General Motors<br>Auburn Hills USA /1996 | Industry<br>Automotive | 10 | **13150**<br>18125 | .<br>. |
| 225 | SGI/Cray<br>T3E900 AC24-128 | Technische Universitaet Braunschweig<br>Braunschweig Germany /1997 | Academic | 24 | **13050**<br>21600 | .<br>. |
| 226 | IBM<br>SP2/67 | Bell South<br>USA /1995 | Industry<br>Database | 67 | **13010**<br>17790 | .<br>. |
| 227 | Fujitsu<br>VPP300/6 | Meiji University<br>Japan /1996 | Academic | 6 | **12850**<br>13200 | .<br>. |
| 228 | Fujitsu/SNI<br>VPP300/6 | Universitaet Darmstadt<br>Darmstadt Germany /1996 | Academic | 6 | **12850**<br>13200 | .<br>. |
| 229 | IBM<br>SP2/66 | University of Umea<br>Norway /1997 | Academic | 66 | **12840**<br>17530 | .<br>. |
| 230 | SGI/Cray<br>T3D MC128-8 | Air Force/Eglin Air Force Base<br>Eglin USA /1994 | Classified | 128 | **12800**<br>19000 | 20736<br>3408 |
| 231 | SGI/Cray<br>T3D MCA128-8 | CNRS/IDRIS<br>Orsay France /1995 | Research | 128 | **12800**<br>19000 | 20736<br>3408 |
| 232 | SGI/Cray<br>T3D MCA128-8 | Commissariat a l'Energie Atomique (CEA)<br>Grenoble France /1994 | Research<br>Energy | 128 | **12800**<br>19000 | 20736<br>3408 |
| 233 | SGI/Cray<br>T3D MC128-8 | Commissariat a l'Energie Atomique (CEA)<br>Limeil-Valenton France /1993 | Research | 128 | **12800**<br>19000 | 20736<br>3408 |
| 234 | SGI/Cray<br>T3D MCA128-8 | Compagnie Generale de Geophysique (CGG)<br>Massy France /1995 | Industry<br>Geophysics | 128 | **12800**<br>19000 | 20736<br>3408 |
| 235 | SGI/Cray<br>T3D MC128-8 | Cray Research<br>Eagan USA /1995 | Vendor | 128 | **12800**<br>19000 | 20736<br>3408 |
| 236 | SGI/Cray<br>T3D MCA128-8 | Cray Research<br>Eagan USA /1996 | Vendor | 128 | **12800**<br>19000 | 20736<br>3408 |
| 237 | SGI/Cray<br>T3D MCA128-8 | ECMWF<br>Reading UK /1994 | Research<br>Weather | 128 | **12800**<br>19000 | 20736<br>3408 |
| 238 | SGI/Cray<br>T3D MCA128-8 | Environmental Protection Agency<br>USA /1995 | Research | 128 | **12800**<br>19000 | 20736<br>3408 |
| 239 | SGI/Cray<br>T3D MC128-8 | Phillips Petroleum Company<br>Bartlesville USA /1994 | Industry<br>Geophysics | 128 | **12800**<br>19000 | 20736<br>3408 |
| 240 | SGI/Cray<br>T3D MCA128-2 | Reactor Nuclear Fuel Development<br>Japan /1994 | Research | 128 | **12800**<br>19000 | 20736<br>3408 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 241 | SGI/Cray<br>T3D MCA128-8 | Tohoku University, Institute of Fluid Science<br>Aramaki Japan /1994 | Academic | 128 | **12800**<br>19000 | 20736<br>3408 |
| 242 | SGI/Cray<br>T3D MC128-8 | University of Alaska - ARSC<br>Fairbanks USA /1995 | Academic | 128 | **12800**<br>19000 | 20736<br>3408 |
| 243 | Sun<br>Ultra HPC 10000 | KT Freetel<br>Seoul Korea /1997 | Industry | 36 | **12700**<br>18000 | .<br>. |
| 244 | Sun<br>Ultra HPC 10000 | Semiconductor company<br>Boise USA /1997 | Industry | 36 | **12700**<br>18000 | .<br>. |
| 245 | IBM<br>SP2/65 | CERN<br>Geneva Switzerland /1995 | Research | 65 | **12670**<br>17260 | .<br>. |
| 246 | SGI/Cray<br>T3E AC32-128 | North Carolina Supercomputing Center (NCSC)<br>USA /1996 | Academic | 32 | **12500**<br>19000 | 27936<br>3360 |
| 247 | IBM<br>SP2/64 | InterUniversity<br>Israel /1996 | Academic | 64 | **12500**<br>17000 | 26500<br>7000 |
| 248 | IBM<br>SP2/64 | University of Houston<br>USA /1996 | Academic | 64 | **12500**<br>17000 | 26500<br>7000 |
| 249 | IBM<br>SP2 P2 120MHz/35 | Chase Manhatten<br>New York USA /1996 | Industry<br>Database | 35 | **12420**<br>16800 | .<br>. |
| 250 | Sun<br>Ultra HPC 6000 | Southwest Bell<br>St. Louis USA /1997 | Industry | 30 | **12420**<br>15000 | 15700<br>4000 |
| 251 | Intel<br>XP/S-MP 15 | ONERA<br>Chatillon France /1995 | Research<br>Aerospace | 294 | **12250**<br>14700 | .<br>. |
| 252 | Intel<br>XP/S-MP 14 | Oak Ridge National Laboratory<br>Oak Ridge USA /1995 | Research | 288 | **12000**<br>14400 | .<br>. |
| 253 | IBM<br>SP2/60 | Tokyo Metropolitan University<br>Tokyo Japan /1995 | Academic | 60 | **11750**<br>15930 | .<br>. |
| 254 | Sun<br>Ultra Enterprise 6000 | Chase Manhatten<br>London UK /1997 | Industry | 28 | **11610**<br>14000 | .<br>. |
| 255 | Sun<br>Ultra Enterprise 6000 | Chase Manhatten<br>London UK /1997 | Industry | 28 | **11610**<br>14000 | .<br>. |
| 256 | Sun<br>Ultra HPC 6000 | KT Freetel<br>Seoul Korea /1997 | Industry | 28 | **11610**<br>14000 | .<br>. |
| 257 | NEC<br>SX-3/24R | National Institute of Fusion Science (NIFS)<br>Japan /1993 | Research | 2 | **11600**<br>13000 | 4352<br>516 |
| 258 | NEC<br>SX-4/6 | DIGICON<br>Houston USA /1996 | Industry<br>Geophysics | 6 | **11510**<br>12000 | .<br>. |
| 259 | IBM<br>SP2/64 | Argonne National Laboratory<br>USA /1996 | Research | 64 | **11400**<br>17000 | .<br>. |
| 260 | IBM<br>SP2 P2 120MHz/32 | IBM - Thomas Watson Research Center - Deep Blue<br>Yorktown Heights USA /1997 | Research<br>Chess | 32 | **11380**<br>15360 | 19500<br>4100 |

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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>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 261 | Sun<br>Ultra HPC 10000 | American Airlines<br>USA /1997 | Industry | 32 | **11340**<br>16000 | 15000<br>2400 |
| 262 | Sun<br>Ultra HPC 10000 | CENAPAD-MG/CO<br>Brazil /1997 | Research | 32 | **11340**<br>16000 | 15000<br>2400 |
| 263 | Sun<br>Ultra HPC 10000 | Ecole Normale Superieure<br>France /1997 | Research | 32 | **11340**<br>16000 | 15000<br>2400 |
| 264 | Sun<br>Ultra HPC 10000 | General Motors/Hughes Missile Systems Company<br>Tuscon USA /1997 | Industry<br>Aerospace | 32 | **11340**<br>16000 | 15000<br>2400 |
| 265 | Sun<br>Ultra HPC 10000 | General Motors/Hughes Missile Systems Company<br>Tuscon USA /1997 | Industry<br>Aerospace | 32 | **11340**<br>16000 | 15000<br>2400 |
| 266 | Sun<br>Ultra HPC 10000 | Micron Technology<br>Boise USA /1997 | Industry | 32 | **11340**<br>16000 | 15000<br>2400 |
| 267 | Sun<br>Ultra HPC 10000 | Nippon Telegraph and Telephone (NTT)<br>Tokyo Japan /1997 | Industry | 32 | **11340**<br>16000 | 15000<br>2400 |
| 268 | Sun<br>Ultra HPC 10000 | Nippon Telegraph and Telephone (NTT)<br>Tokyo Japan /1997 | Industry | 32 | **11340**<br>16000 | 15000<br>2400 |
| 269 | Sun<br>Ultra HPC 6000 | Comdisco<br>Carlstadt USA /1997 | Industry | 27 | **11206**<br>13500 | .<br>. |
| 270 | Sun<br>Ultra HPC 6000 | Posten<br>Alingsas Sweden /1997 | Industry | 27 | **11206**<br>13500 | .<br>. |
| 271 | IBM<br>SP2/56 | BC Tel<br>Canada /1996 | Industry | 56 | **11010**<br>14870 | .<br>. |
| 272 | SGI/Cray<br>Y-MP T916/8512 | Chrysler Motors Company<br>USA /1996 | Industry<br>Automotive | 8 | **10880**<br>14500 | .<br>. |
| 273 | SGI/Cray<br>Y-MP T916/8256 | Commissariat a l'Energie Atomique (CEA)<br>Limeil France /1996 | Research | 8 | **10880**<br>14500 | .<br>. |
| 274 | SGI/Cray<br>Y-MP T916/8256 | Merck Co<br>USA /1997 | Industry<br>Chemistry | 8 | **10880**<br>14500 | .<br>. |
| 275 | Sun<br>Ultra HPC 6000 | Pratt and Whitney<br>Hartford USA /1997 | Industry | 26 | **10800**<br>13000 | .<br>. |
| 276 | Fujitsu<br>VPP300/5 | Fujitsu<br>San Jose USA /1996 | Vendor | 5 | **10720**<br>11000 | .<br>. |
| 277 | IBM<br>SP2/54 | Autozone<br>Memphis USA /1995 | Industry<br>Database | 54 | **10640**<br>14340 | .<br>. |
| 278 | Fujitsu<br>VPP500/7 | Institute of Space Astronautical Science (ISAS)<br>Tokyo Japan /1993 | Research | 7 | **10525**<br>11200 | .<br>. |
| 279 | SGI/Cray<br>ORIGIN 2000 | Albert-Einstein-Institut - MPI<br>Potsdam Germany /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 280 | SGI/Cray<br>ORIGIN 2000 | BMW AG<br>Muenchen Germany /1996 | Industry<br>Automotive | 32 | **10420**<br>12480 | 22000<br>4000 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 281 | SGI/Cray<br>ORIGIN 2000 | Boston University<br>Boston USA /1996 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 282 | SGI/Cray<br>ORIGIN 2000 | Boston University<br>Boston USA /1997 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 283 | SGI/Cray<br>ORIGIN 2000 | C4 / Centre Europeo del Parallelismo de Barcelona<br>Barcelona Spain /1997 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 284 | SGI/Cray<br>ORIGIN 2000 | Chalmers University of Technology<br>Goteborg Sweden /1996 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 285 | SGI/Cray<br>ORIGIN 2000 | Chalmers University of Technology<br>Goteborg Sweden /1997 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 286 | SGI/Cray<br>ORIGIN 2000 | DOD/CEWES<br>Vicksburg USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 287 | SGI/Cray<br>ORIGIN 2000 | E-Systems/Raytheon<br>USA /1997 | Industry | 32 | **10420**<br>12480 | 22000<br>4000 |
| 288 | SGI/Cray<br>ORIGIN 2000 | E-Systems/Raytheon<br>USA /1997 | Industry | 32 | **10420**<br>12480 | 22000<br>4000 |
| 289 | SGI/Cray<br>ORIGIN 2000 | Ecole Polytechnique Federale de Lausanne<br>Lausanne Switzerland /1996 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 290 | SGI/Cray<br>ORIGIN 2000 | Industrial Light Magic<br>USA /1997 | Industry<br>Image Proc. | 32 | **10420**<br>12480 | 22000<br>4000 |
| 291 | SGI/Cray<br>ORIGIN 2000 | Informix<br>Menlo Park USA /1997 | Industry<br>Database | 32 | **10420**<br>12480 | 22000<br>4000 |
| 292 | SGI/Cray<br>ORIGIN 2000 | Informix<br>Menlo Park USA /1997 | Industry<br>Database | 32 | **10420**<br>12480 | 22000<br>4000 |
| 293 | SGI/Cray<br>ORIGIN 2000 | Informix<br>Menlo Park USA /1997 | Industry<br>Database | 32 | **10420**<br>12480 | 22000<br>4000 |
| 294 | SGI/Cray<br>ORIGIN 2000 | Japan Information Processing Service<br>Japan /1996 | Industry | 32 | **10420**<br>12480 | 22000<br>4000 |
| 295 | SGI/Cray<br>ORIGIN 2000 | Kyoto University<br>Kyoto Japan /1996 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 296 | SGI/Cray<br>ORIGIN 2000 | Kyoto University<br>Kyoto Japan /1996 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 297 | SGI/Cray<br>ORIGIN 2000 | Kyoto University<br>Kyoto Japan /1996 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 298 | SGI/Cray<br>ORIGIN 2000 | Kyoto University<br>Kyoto Japan /1996 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |
| 299 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 300 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 301 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 302 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 303 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 304 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 305 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 306 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 307 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 308 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 309 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 310 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 311 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 312 | SGI/Cray<br>ORIGIN 2000 | Los Alamos National Laboratory<br>Los Alamos USA /1996 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 313 | SGI/Cray<br>ORIGIN 2000 | NASA/Ames Research Center/NAS<br>Mountain View USA /1997 | Research<br>Aerospace | 32 | **10420**<br>12480 | 22000<br>4000 |
| 314 | SGI/Cray<br>ORIGIN 2000 | NASA/Ames Research Center/NAS<br>Mountain View USA /1997 | Research<br>Aerospace | 32 | **10420**<br>12480 | 22000<br>4000 |
| 315 | SGI/Cray<br>ORIGIN 2000 | NASA/Langley Research Center<br>Langley USA /1997 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 316 | SGI/Cray<br>ORIGIN 2000 | NCSA<br>Urbana-Champaign USA /1997 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 317 | SGI/Cray<br>ORIGIN 2000 | NCSA<br>Urbana-Champaign USA /1997 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 318 | SGI/Cray<br>ORIGIN 2000 | NCSA<br>Urbana-Champaign USA /1997 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 319 | SGI/Cray<br>ORIGIN 2000 | NCSA<br>Urbana-Champaign USA /1997 | Research | 32 | **10420**<br>12480 | 22000<br>4000 |
| 320 | SGI/Cray<br>ORIGIN 2000 | Nara Institute of Science and Technology (NAIST)<br>Japan /1997 | Academic | 32 | **10420**<br>12480 | 22000<br>4000 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $world$ | Manufacturer Computer | Installation Site Location/Year | Field of Application | # Proc. | $\mathbf{R_{max}}$ $R_{peak}$ [Mflop/s] | $N_{max}$ $N_{1/2}$ |
|---|---|---|---|---|---|---|
| 321 | SGI/Cray ORIGIN 2000 | Sandia National Labs Albuquerque USA /1997 | Research | 32 | **10420** 12480 | 22000 4000 |
| 322 | SGI/Cray ORIGIN 2000 | Schlumberger Doll Research Ridgefield USA /1997 | Industry Geophysics | 32 | **10420** 12480 | 22000 4000 |
| 323 | SGI/Cray ORIGIN 2000 | Silicon Graphics Cortaillod Switzerland /1996 | Vendor Benchmarking | 32 | **10420** 12480 | 22000 4000 |
| 324 | SGI/Cray ORIGIN 2000 | Universidad Nacional Autonoma de Mexico Mexico /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 325 | SGI/Cray ORIGIN 2000 | Universitaet Dresden Dresden Germany /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 326 | SGI/Cray ORIGIN 2000 | Universitaet der Bundeswehr Muenchen Germany /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 327 | SGI/Cray ORIGIN 2000 | University of Bergen Bergen Norway /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 328 | SGI/Cray ORIGIN 2000 | University of Bergen Bergen Norway /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 329 | SGI/Cray ORIGIN 2000 | University of Bergen Bergen Norway /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 330 | SGI/Cray ORIGIN 2000 | University of Bergen Bergen Norway /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 331 | SGI/Cray ORIGIN 2000 | University of California - Santa Barbara Santa Barbara USA /1997 | Academic | 32 | **10420** 12480 | 22000 4000 |
| 332 | SGI/Cray ORIGIN 2000 | Wright-Patterson Air Force Base USA /1996 | Research | 32 | **10420** 12480 | 22000 4000 |
| 333 | SGI/Cray ORIGIN 2000 | Wright-Patterson Air Force Base USA /1996 | Research | 32 | **10420** 12480 | 22000 4000 |
| 334 | SGI/Cray ORIGIN 2000 | Wright-Patterson Air Force Base USA /1996 | Research | 32 | **10420** 12480 | 22000 4000 |
| 335 | SGI/Cray ORIGIN 2000 | Wright-Patterson Air Force Base USA /1996 | Research | 32 | **10420** 12480 | 22000 4000 |
| 336 | SGI/Cray ORIGIN 2000 | Wright-Patterson Air Force Base USA /1997 | Research | 32 | **10420** 12480 | 22000 4000 |
| 337 | SGI/Cray ORIGIN 2000 | Wright-Patterson Air Force Base USA /1997 | Research | 32 | **10420** 12480 | 22000 4000 |
| 338 | SGI/Cray ORIGIN 2000 | Wright-Patterson Air Force Base USA /1997 | Research | 32 | **10420** 12480 | 22000 4000 |
| 339 | Hewlett-Packard SPP1600/XA-64 | Hewlett-Packard CXTC Richardson USA /1996 | Vendor Benchmarking | 64 | **10402** 15360 | . . |
| 340 | Sun Ultra HPC 6000 | Tokyo Mitsubishi Bank London UK /1997 | Industry | 25 | **10390** 12500 | . . |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 341 | SGI/Cray<br>Y-MP C916/12512 | Ford<br>Koeln Germany /1997 | Industry<br>Automotive | 12 | **10270**<br>11430 | .<br>. |
| 342 | SGI/Cray<br>Y-MP C916/121024 | SARA (Stichting Academisch Rekencentrum)<br>Amsterdam Netherlands /1997 | Academic | 12 | **10270**<br>11430 | .<br>. |
| 343 | SGI/Cray<br>Y-MP C916/12256 | Tokyo Institute of Technology<br>Tokyo Japan /1995 | Academic | 12 | **10270**<br>11430 | .<br>. |
| 344 | IBM<br>SP2/45 | Tokyo Denryoko<br>Japan /1996 | Industry | 45 | **10220**<br>13860 | .<br>. |
| 345 | Sun<br>Berkley NOW | University of California at Berkeley<br>Berkeley USA /1997 | Academic | 100 | **10140**<br>33400 | 32768<br>8192 |
| 346 | IBM<br>SP2/51 | Shell Intl. Petroleum<br>Netherlands /1996 | Industry<br>Geophysics | 51 | **10090**<br>13540 | .<br>. |
| 347 | IBM<br>SP2/51 | ShopKo Stores<br>Green Bay USA /1996 | Industry<br>Database | 51 | **10090**<br>13540 | .<br>. |
| 348 | Intel<br>XP/S25 | NAL<br>Japan /1994 | Research | 336 | **10000**<br>16800 | .<br>. |
| 349 | Intel<br>XP/S25 | NRAD<br>USA /1994 | Research | 336 | **10000**<br>16800 | .<br>. |
| 350 | Sun<br>Ultra HPC 6000 | Abbey National<br>London UK /1997 | Industry | 24 | **9992**<br>12000 | 15700<br>1632 |
| 351 | Sun<br>Ultra HPC 6000 | Abbey National<br>London UK /1997 | Industry | 24 | **9992**<br>12000 | 15700<br>1632 |
| 352 | Sun<br>Ultra HPC 6000 | Bundesamt fr Seeschiffahrt und Hydrographie (BSH)<br>Hamburg Germany /1997 | Research | 24 | **9992**<br>12000 | 15700<br>1632 |
| 353 | Sun<br>Ultra HPC 6000 | CSX<br>Jacksonville USA /1997 | Industry | 24 | **9992**<br>12000 | 15700<br>1632 |
| 354 | Sun<br>Ultra HPC 6000 | Disney World<br>Lake Buena Vista USA /1997 | Industry | 24 | **9992**<br>12000 | 15700<br>1632 |
| 355 | Sun<br>Ultra HPC 6000 | OR Telematique<br>Paris France /1997 | Industry | 24 | **9992**<br>12000 | 15700<br>1632 |
| 356 | Sun<br>Ultra HPC 6000 | OR Telematique<br>Paris France /1997 | Industry | 24 | **9992**<br>12000 | 15700<br>1632 |
| 357 | Sun<br>Ultra HPC 6000 | S3<br>Santa Clara USA /1997 | Industry | 24 | **9992**<br>12000 | 15700<br>1632 |
| 358 | Sun<br>Ultra HPC 6000 | Weizman Research Institute<br>Israel /1997 | Research | 24 | **9992**<br>12000 | 15700<br>1632 |
| 359 | IBM<br>SP2/50 | Deutsche Telekom AG<br>Darmstadt Germany /1996 | Industry<br>Database | 50 | **9900**<br>13280 | .<br>. |
| 360 | IBM<br>SP2/50 | Federal Express<br>USA /1995 | Industry<br>Database | 50 | **9900**<br>13280 | .<br>. |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 361 | IBM<br>SP2/50 | Nihon Genken Tokai<br>Japan /1995 | Research | 50 | **9900**<br>13280 | .<br>. |
| 362 | TMC<br>CM-200/64k | Los Alamos National Laboratory<br>Los Alamos USA / . | Research<br>Energy | 2048 | **9800**<br>20000 | 29696<br>11264 |
| 363 | TMC<br>CM-200/64k | Los Alamos National Laboratory<br>Los Alamos USA / . | Research<br>Energy | 2048 | **9800**<br>20000 | 29696<br>11264 |
| 364 | SGI/Cray<br>Y-MP T916/7256 | Chrysler Motors Company<br>USA /1997 | Industry<br>Automotive | 7 | **9590**<br>12600 | .<br>. |
| 365 | IBM<br>SP2/48 | Ensign<br>UK /1996 | Industry<br>Geophysics | 48 | **9530**<br>12750 | .<br>. |
| 366 | IBM<br>SP2/48 | Institute of Math and Statistics<br>Japan /1995 | Research | 48 | **9530**<br>12750 | .<br>. |
| 367 | IBM<br>SP2/48 | NASA/Langley Research Center<br>Hampton USA /1994 | Research | 48 | **9530**<br>12750 | .<br>. |
| 368 | IBM<br>SP2/48 | Okazaki Bunshi Ken<br>Japan /1994 | Research | 48 | **9530**<br>12750 | .<br>. |
| 369 | IBM<br>SP2/48 | PCS Inc<br>USA /1996 | Industry | 48 | **9530**<br>12750 | .<br>. |
| 370 | IBM<br>SP2/48 | Rika dai<br>Japan /1996 | Academic | 48 | **9530**<br>12750 | .<br>. |
| 371 | IBM<br>SP2/48 | University of Michigan<br>Michigan USA /1996 | Academic | 48 | **9530**<br>12750 | .<br>. |
| 372 | SGI/Cray<br>T3E AC24-128 | TU Berlin<br>Berlin Germany /1996 | Research | 24 | **9420**<br>14400 | .<br>. |
| 373 | SGI/Cray<br>T3E AC24-128 | Universitaet Hannover / RRZN<br>Germany /1996 | Academic | 24 | **9420**<br>14400 | .<br>. |
| 374 | SGI/Cray<br>POWER CHALLENGEarray | Government<br>USA /1995 | Classified | 40 | **9398**<br>14400 | 27000<br>6775 |
| 375 | SGI/Cray<br>POWER CHALLENGEarray | Government<br>USA /1995 | Classified | 40 | **9398**<br>14400 | 27000<br>6775 |
| 376 | SGI/Cray<br>ORIGIN 2000 | Kobe Univeristy<br>Kobe Japan /1996 | Academic | 28 | **9170**<br>10920 | .<br>. |
| 377 | SGI/Cray<br>ORIGIN 2000 | Princeton University<br>Princeton USA /1996 | Academic | 28 | **9170**<br>10920 | .<br>. |
| 378 | IBM<br>SP2/46 | Tohoku University, Kohgaku-bu<br>Aramaki Japan /1996 | Academic | 46 | **9160**<br>12210 | .<br>. |
| 379 | IBM<br>SP2/46 | Western Geophysical<br>UK /1997 | Industry<br>Geophysics | 46 | **9160**<br>12210 | .<br>. |
| 380 | Sun<br>Ultra HPC 6000 | GlaxoWellcom<br>Raleigh USA /1997 | Industry<br>Pharmaceutics | 22 | **9160**<br>11000 | .<br>. |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 381 | Fujitsu<br>VPP500/6 | Fujitsu Ltd.<br>Numazu Japan /1996 | Vendor | 6 | **9050**<br>9600 | .<br>. |
| 382 | IBM<br>SP2/44 | C4 / Centre de Supercomputacio de Catalunya<br>Barcelona Spain /1996 | Academic | 44 | **8790**<br>11680 | .<br>. |
| 383 | Sun<br>Ultra HPC 6000 | Cincinnati Bell Information Systems (CBIS)<br>Cleveland USA /1997 | Industry | 21 | **8750**<br>11500 | .<br>. |
| 384 | Sun<br>Ultra HPC 6000 | European Commission<br>Luxembourg /1997 | Classified | 21 | **8750**<br>11500 | .<br>. |
| 385 | Fujitsu<br>VPP300/4 | ECMWF<br>Reading UK /1996 | Research<br>Weather | 4 | **8600**<br>8800 | 28800<br>1280 |
| 386 | Fujitsu<br>VX/4 | Fujitsu (FECIT)<br>Uxbridge UK /1996 | Vendor | 4 | **8600**<br>8800 | 28800<br>1280 |
| 387 | Fujitsu<br>VPP300/4 | SNECMA<br>France /1997 | Industry<br>Aerospace | 4 | **8600**<br>8800 | 28800<br>1280 |
| 388 | Fujitsu<br>VX/4 | Shimizu Corporation<br>Tokyo Japan /1996 | Academic | 4 | **8600**<br>8800 | 28800<br>1280 |
| 389 | Fujitsu<br>VX/4 | Tokyo Metropolitan University<br>Tokyo Japan /1996 | Academic | 4 | **8600**<br>8800 | 28800<br>1280 |
| 390 | Fujitsu/SNI<br>VPP300/4 | Universitaet Hannover / RRZN<br>Hannover Germany /1996 | Academic | 4 | **8600**<br>8800 | 28800<br>1280 |
| 391 | Fujitsu<br>VPP300/4 | Western Geophysical<br>Houston USA /1996 | Industry<br>Geophysics | 4 | **8600**<br>8800 | 28800<br>1280 |
| 392 | IBM<br>SP2 P2 120MHz/24 | Maui Research and Technology Center (MRTC)<br>USA /1996 | Industry | 24 | **8570**<br>11520 | .<br>. |
| 393 | SGI/Cray<br>POWER CHALLENGEarray | DOD/CEWES<br>Vicksburg USA /1996 | Research | 36 | **8470**<br>12960 | .<br>. |
| 394 | SGI/Cray<br>POWER CHALLENGEarray | Naval Oceanographic Office (NAVOCEANO)<br>Stennis Space Center USA /1996 | Research<br>Aerospace | 36 | **8470**<br>12960 | .<br>. |
| 395 | IBM<br>SP2/42 | Chuodai Riko<br>Japan /1996 | Academic | 42 | **8420**<br>11150 | .<br>. |
| 396 | IBM<br>SP2/42 | Federal Express<br>USA /1996 | Industry<br>Database | 42 | **8420**<br>11150 | .<br>. |
| 397 | IBM<br>SP2/42 | Fidelity Investments<br>USA /1995 | Industry<br>Finance | 42 | **8420**<br>11150 | .<br>. |
| 398 | Sun<br>Ultra HPC 6000 | ARAMCO<br>Saudi Arabia /1997 | Industry<br>Geophysics | 20 | **8340**<br>10000 | .<br>. |
| 399 | Sun<br>Ultra HPC 6000 | British Gas<br>Couventry UK /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 400 | Sun<br>Ultra HPC 6000 | British Gas<br>Couventry UK /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |

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## TOP500 **Supercomputers - Worldwide**

| **N** $world$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 401 | Sun<br>Ultra HPC 6000 | Deutsche Bahn AG<br>Berlin Germany /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 402 | Sun<br>Ultra HPC 6000 | Deutsche Bahn AG<br>Berlin Germany /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 403 | Sun<br>Ultra HPC 6000 | Finaref<br>France /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 404 | Sun<br>Ultra HPC 6000 | KT Freetel<br>Seoul Korea /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 405 | Sun<br>Ultra HPC 6000 | KT Freetel<br>Seoul Korea /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 406 | Sun<br>Ultra HPC 6000 | LSI Logic<br>Milpitas USA /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 407 | Sun<br>Ultra HPC 6000 | MRC<br>UK /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 408 | Sun<br>Ultra HPC 6000 | Morse Computer<br>London UK /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 409 | Sun<br>Ultra HPC 6000 | PP<br>Manchester UK /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 410 | Sun<br>Ultra HPC 6000 | SAP<br>Walldorf Germany /1997 | Industry | 20 | **8340**<br>10000 | .<br>. |
| 411 | SGI/Cray<br>Y-MP T916/6512 | Naval Oceanographic Office (NAVOCEANO)<br>Bay Saint Louis USA /1996 | Research | 6 | **8300**<br>10850 | .<br>. |
| 412 | SGI/Cray<br>POW CHALLarray 10000 | NCSA<br>Urbana-Champaign USA /1996 | Research | 72 | **8233**<br>28080 | .<br>. |
| 413 | SGI/Cray<br>POW CHALLarray 10000 | NCSA<br>Urbana-Champaign USA /1996 | Research | 72 | **8233**<br>28080 | .<br>. |
| 414 | SGI/Cray<br>POWER CHALLENGE 10000 | Biomolecular Eng. Research Institute<br>Suita Japan /1996 | Research | 32 | **8233**<br>12480 | 16000<br>4000 |
| 415 | SGI/Cray<br>POWER CHALLENGE 10000 | Kyoto University<br>Kyoto Japan /1996 | Academic | 32 | **8233**<br>12480 | 16000<br>4000 |
| 416 | SGI/Cray<br>POWER CHALLENGE 10000 | Kyoto University<br>Kyoto Japan /1996 | Academic | 32 | **8233**<br>12480 | 16000<br>4000 |
| 417 | IBM<br>SP2/41 | ISSC, Unisource<br>USA /1996 | Industry | 41 | **8230**<br>10890 | .<br>. |
| 418 | IBM<br>SP2/41 | Petro Canada<br>Canada /1995 | Industry<br>Geophysics | 41 | **8230**<br>10890 | .<br>. |
| 419 | IBM<br>SP2/40 | National Cancer Research Institute<br>Tokyo Japan /1994 | Research | 40 | **8050**<br>10620 | .<br>. |
| 420 | IBM<br>SP2/40 | Seoul National University<br>Seoul Korea /1995 | Academic | 40 | **8050**<br>10620 | .<br>. |

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## TOP500 **Supercomputers - Worldwide**

| **N** $world$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 421 | IBM<br>SP2/40 | UNI-C/Lyngby<br>Denmark /1995 | Academic | 40 | **8050**<br>10620 | .<br>. |
| 422 | Parsytec<br>GC PowerPlus/192 | Universitaet Heidelberg - IWR<br>Heidelberg Germany /1995 | Academic | 192 | **7999**<br>15360 | 27192<br>9500 |
| 423 | Parsytec<br>GC PowerPlus/192 | Universitaet Paderborn - PC2<br>Paderborn Germany /1995 | Academic | 192 | **7999**<br>15360 | 27192<br>9500 |
| 424 | IBM<br>SP2/35 | ARAMCO<br>Saudi Arabia /1996 | Industry<br>Geophysics | 35 | **7970**<br>10780 | .<br>. |
| 425 | SGI/Cray<br>ORIGIN 2000 | Baylor College of Medicine<br>Houston USA /1996 | Academic | 24 | **7928**<br>9360 | 19000<br>3500 |
| 426 | SGI/Cray<br>ORIGIN 2000 | Chinese University of Hong Kong<br>Hong Kong Hong Kong /1996 | Academic | 24 | **7928**<br>9360 | 19000<br>3500 |
| 427 | SGI/Cray<br>ORIGIN 2000 | Keio Univeristy<br>Japan /1997 | Academic | 24 | **7928**<br>9360 | 19000<br>3500 |
| 428 | SGI/Cray<br>ORIGIN 2000 | NRC's Steacie Institute for Molecular Sciences<br>Ottawa Canada /1996 | Research | 24 | **7928**<br>9360 | 19000<br>3500 |
| 429 | SGI/Cray<br>ORIGIN 2000 | Pratt and Whitney<br>Canada /1996 | Industry<br>Aerospace | 24 | **7928**<br>9360 | 19000<br>3500 |
| 430 | SGI/Cray<br>ORIGIN 2000 | Sony Pictures<br>USA /1997 | Industry<br>Image Proc. | 24 | **7928**<br>9360 | 19000<br>3500 |
| 431 | SGI/Cray<br>ORIGIN 2000 | Volvo<br>Gothenberg Sweden /1996 | Industry<br>Automotive | 24 | **7928**<br>9360 | 19000<br>3500 |
| 432 | Hewlett-Packard<br>SPP1600/XA-48 | Universitaet Erlangen<br>Erlangen Germany /1996 | Academic | 48 | **7920**<br>11520 | .<br>. |
| 433 | Sun<br>Ultra HPC 6000 | Visa<br>San Mateo USA /1997 | Industry | 19 | **7920**<br>9500 | .<br>. |
| 434 | IBM<br>SP2/39 | Burnham Service Corporation<br>USA /1996 | Industry | 39 | **7860**<br>10350 | .<br>. |
| 435 | IBM<br>SP2/39 | Western Geophysical<br>Houston USA /1997 | Industry<br>Geophysics | 39 | **7860**<br>10350 | .<br>. |
| 436 | SGI/Cray<br>POWER CHALLENGEarray | Government<br>USA /1995 | Classified | 40 | **7831**<br>12000 | 27000<br>6775 |
| 437 | SGI/Cray<br>POWER CHALLENGEarray | Government<br>USA /1995 | Classified | 40 | **7831**<br>12000 | 27000<br>6775 |
| 438 | SGI/Cray<br>POWER CHALLENGEarray | Government<br>USA /1995 | Classified | 40 | **7831**<br>12000 | 27000<br>6775 |
| 439 | Hewlett-Packard<br>Exemplar S-Class | Advanced Data Solution<br>Houston USA /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 440 | Hewlett-Packard<br>Exemplar S-Class | Arnold Engineering Development Center (AEDC)<br>Arnold AFB USA /1997 | Classified | 16 | **7783**<br>11500 | 13320<br>1044 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 441 | Hewlett-Packard<br>Exemplar S-Class | Centro Informatico Cientifico de Andalucia (CICA)<br>Spain /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 442 | Hewlett-Packard<br>Exemplar S-Class | Colsa<br>Huntsville USA /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 443 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 444 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 445 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 446 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 447 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 448 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 449 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 450 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 451 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 452 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1996 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 453 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 454 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 455 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 456 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 457 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 458 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 459 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 460 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |

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## TOP500 **Supercomputers - Worldwide**

| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 461 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 462 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 463 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 464 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 465 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 466 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 467 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 468 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 469 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 470 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 471 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 472 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 473 | Hewlett-Packard<br>Exemplar S-Class | Defense Contractor<br>Orlando USA /1997 | Industry<br>AFIS | 16 | **7783**<br>11500 | 13320<br>1044 |
| 474 | Hewlett-Packard<br>Exemplar S-Class | Donaldson<br>Bloomington USA /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 475 | Hewlett-Packard<br>Exemplar S-Class | ELF Aquitaine<br>Pau France /1997 | Industry<br>Geophysics | 16 | **7783**<br>11500 | 13320<br>1044 |
| 476 | Hewlett-Packard<br>Exemplar S-Class | EPPA<br>Spain /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 477 | Hewlett-Packard<br>Exemplar S-Class | Electronic Warfare Associates (EWA)<br>Herndon USA /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 478 | Hewlett-Packard<br>Exemplar S-Class | Hewlett-Packard CXTC<br>Richardson USA /1996 | Vendor<br>Benchmarking | 16 | **7783**<br>11500 | 13320<br>1044 |
| 479 | Hewlett-Packard<br>Exemplar S-Class | NCSA<br>Urbana-Champaign USA /1996 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 480 | Hewlett-Packard<br>Exemplar S-Class | Naval Research Laboratory (NRL)<br>Washington D.C. USA /1997 | Classified | 16 | **7783**<br>11500 | 13320<br>1044 |

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| **N** $_{world}$ | Manufacturer<br>Computer | Installation Site<br>Location/Year | Field of<br>Application | #<br>Proc. | $\mathbf{R_{max}}$<br>$R_{peak}$<br>[Mflop/s] | $N_{max}$<br>$N_{1/2}$ |
|---|---|---|---|---|---|---|
| 481 | Hewlett-Packard<br>Exemplar S-Class | Raytheon<br>Lexington USA /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 482 | Hewlett-Packard<br>Exemplar S-Class | Rice University<br>Houston USA /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 483 | Hewlett-Packard<br>Exemplar S-Class | Rice University<br>Houston USA /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 484 | Hewlett-Packard<br>Exemplar S-Class | SNPE<br>France /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 485 | Hewlett-Packard<br>Exemplar S-Class | Universitaet Bielefeld<br>Bielefeld Germany /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 486 | Hewlett-Packard<br>Exemplar S-Class | Universitaet Duisburg<br>Duisburg Germany /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 487 | Hewlett-Packard<br>Exemplar S-Class | Yukawa Institute for Theoretical Physics (YITP)<br>Japan /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 488 | Hewlett-Packard<br>Exemplar X-Class | Kodak<br>Rochester USA /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 489 | Hewlett-Packard<br>Exemplar X-Class | Martin-Luther Universitaet Halle-Wittenberg<br>Halle Germany /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 490 | Hewlett-Packard<br>Exemplar X-Class | Martin-Luther Universitaet Halle-Wittenberg<br>Halle Germany /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 491 | Hewlett-Packard<br>Exemplar X-Class | NCAR (National Center for Atmospheric Research)<br>Boulder USA /1997 | Research<br>Weather | 16 | **7783**<br>11500 | 13320<br>1044 |
| 492 | Hewlett-Packard<br>Exemplar X-Class | NCAR (National Center for Atmospheric Research)<br>Boulder USA /1997 | Research<br>Weather | 16 | **7783**<br>11500 | 13320<br>1044 |
| 493 | Hewlett-Packard<br>Exemplar X-Class | Sharp<br>Osaka Japan /1997 | Industry | 16 | **7783**<br>11500 | 13320<br>1044 |
| 494 | Hewlett-Packard<br>Exemplar X-Class | University of California - Irvine<br>Irvine USA /1997 | Academic | 16 | **7783**<br>11500 | 13320<br>1044 |
| 495 | TMC<br>CM-5E/128 | The Angstrom Technology Partnership<br>Tsukuba Japan /1994 | Research | 128 | **7700**<br>20000 | 18432<br>8192 |
| 496 | TMC<br>CM-5/128 | Institut de Physique du Globe de Paris (IPG)<br>Paris France /1992 | Research | 128 | **7700**<br>16000 | 18432<br>8192 |
| 497 | TMC<br>CM-5/128 | MIT<br>Cambridge USA / . | Research | 128 | **7700**<br>16000 | 18432<br>8192 |
| 498 | IBM<br>SP2/38 | GMD<br>Germany /1995 | Research | 38 | **7680**<br>10090 | .<br>. |
| 499 | IBM<br>SP2/38 | Kirin Beer<br>Japan /1996 | Industry<br>Database | 38 | **7680**<br>10090 | .<br>. |
| 500 | IBM<br>SP2/38 | UCLA<br>Los Angeles USA /1994 | Academic | 38 | **7680**<br>10090 | .<br>. |

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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 [3], 1994 [4], 1995 [5] and, 1996 [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/Cray | 130 | 50 | 20 | 4 | 204 |
| Cray only | 63 | 35 | 9 | 2 | 109 |
| SGI only | 67 | 15 | 11 | 2 | 95 |
| IBM | 37 | 18 | 11 | 4 | 70 |
| Hewlett-Packard | 54 | 11 | 2 | | 67 |
| Sun | 25 | 22 | 4 | 9 | 60 |
| Fujitsu | 2 | 10 | 21 | 1 | 34 |
| NEC | 4 | 6 | 14 | | 24 |
| Hitachi | | 1 | 12 | | 13 |
| Intel | 9 | 2 | 2 | | 13 |
| TMC | 9 | 1 | 1 | | 11 |
| others | 2 | 2 | | | 4 |
| Total | 272 | 123 | 87 | 18 | 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/Cray | 3114.2 | 1953.2 | 327.2 | 101.3 | 5495.9 |
| Cray only | 2335.2 | 1790.6 | 222.9 | 83.0 | 4431.7 |
| SGI only | 779.0 | 162.6 | 104.3 | 18.3 | 1064.2 |
| IBM | 1023.5 | 253.4 | 107.6 | 43.8 | 1428.3 |
| Hewlett-Packard | 473.5 | 100.2 | 15.6 | | 589.3 |
| Sun | 342.3 | 220.6 | 60.7 | 103.9 | 727.4 |
| Fujitsu | 19.3 | 283.1 | 1009.8 | 27.7 | 1339.9 |
| NEC | 85.4 | 185.5 | 518.3 | | 789.3 |
| Hitachi | | 22.2 | 835.0 | | 857.1 |
| Intel | 1438.5 | 31.0 | 113.5 | | 1583.0 |
| TMC | 215.0 | 7.7 | 7.7 | | 230.4 |
| others | 49.4 | 16.0 | | | 65.4 |
| Total | 6761.1 | 3072.9 | 2995.3 | 276.7 | 13106 |

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

| **TOP500 Statistics — Installed $R_{peak}$ [Gflop/s]** | | | | | |
|---|---|---|---|---|---|
| | USA/Canada | Europe | Japan | others | Total |
| SGI/Cray | 4692.0 | 3319.2 | 482.5 | 152.2 | 8646.0 |
| Cray only | 3671.2 | 3122.6 | 349.9 | 130.4 | 7274.2 |
| SGI only | 1020.8 | 196.6 | 132.6 | 21.8 | 1371.8 |
| IBM | 1521.0 | 354.8 | 144.5 | 59.7 | 2080.0 |
| Hewlett-Packard | 992.4 | 167.5 | 23.0 | | 1182.9 |
| Sun | 494.9 | 275.5 | 88.0 | 138.0 | 996.4 |
| Fujitsu | 19.8 | 297.0 | 1141.4 | 28.6 | 1486.8 |
| NEC | 92.0 | 195.5 | 548.5 | | 836.0 |
| Hitachi | | 28.8 | 1215.0 | | 1243.8 |
| Intel | 1935.5 | 37.2 | 141.9 | | 2114.6 |
| TMC | 470.8 | 16.0 | 20.0 | | 506.8 |
| others | 126.7 | 30.7 | | | 157.4 |
| Total | 10345 | 4722.2 | 3804.8 | 378.5 | 19251 |

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