TOP500 Supercomputer Sites

13th Edition

Jack J. Dongarra

Computer Science Department
University of Tennessee
Knoxville, TN 37996-1301

and

Mathematical Science Section
Oak Ridge National Laboratory
Oak Ridge, TN 37831-6367

dongarra@cs.utk.edu

Hans W. Meuer

Computing Center
University of Mannheim
D-68131 Mannheim
Germany

meuer@rz.uni-mannheim.de

Erich Strohmaier

Computer Science Department
University of Tennessee
Knoxville, TN 37996-1301

erich@cs.utk.edu

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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://www.top500.org 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 Computer	Installation Site Location/Year	Field of Application	# Proc.	**R$_{max}$** R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
1	Intel ASCI Red	Sandia National Labs Albuquerque USA /1999	Research	9472	**2121.3** 3154	251904 66000
2	SGI ASCI Blue Mountain	Los Alamos National Laboratory Los Alamos USA /1998	Research	6144	**1608** 3072	374400 138000
3	SGI T3E1200	Government USA /1998	Classified	1084	**891.5** 1300.8	259200 26400
4	Hitachi SR8000/128	University of Tokyo Tokyo Japan /1999	Academic	128	**873.6** 1024	120000 16000
5	SGI T3E900	Government USA /1997	Classified	1324	**815.1** 1191.6	134400 26880
6	SGI ORIGIN 2000 250 MHz	Los Alamos National Laboratory/ACL Los Alamos USA /1999	Research	2048	**690.9** 1024	229248 80640
7	SGI T3E900	United Kingdom Meteorological Office Bracknell UK /1997	Research Weather	876	**552.92** 788.4	. .
8	IBM SP Silver	IBM Poughkeepsie USA /1998	Vendor Energy	1952	**547** 1296	244000 58000
9	SGI T3E900	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1999	Research Weather	812	**515.1** 730.8	. .
10	SGI T3E1200	UK Centre for Science Manchester UK /1998	Academic	612	**509.9** 734.4	. .
11	IBM ASCI Blue Pacific CTR SP Silver	Lawrence Livermore National Laboratory Livermore USA /1998	Research Energy	1344	**468.2** 892	205000 65000
12	Hitachi SR8000/64	AIST - COACT/Tsukuba Advanced Computing Center Tsukuba Japan /1999	Research	64	**449.7** 512	92000 9160
13	SGI T3E	NASA/Goddard Space Flight Center Greenbelt USA /1998	Research Weather	1084	**448.6** 650.4	119808 19008
14	SGI T3E1200	DOD/CEWES Vicksburg USA /1999	Research Mechanics	540	**447.8** 648	181440 17280
15	SGI T3E1200	Deutscher Wetterdienst Offenbach Germany /1998	Research Weather	540	**447.8** 648	181440 17280
16	SGI T3E1200	Silicon Graphics Chippewa Falls USA /1998	Vendor	540	**447.8** 648	181440 17280
17	SGI T3E900	NERSC/LBNL Berkeley USA /1997	Research	692	**444.2** 622.8	. .
18	Hitachi/Tsukuba CP-PACS/2048	Center for Computational Physics, Univ of Tsukuba Tsukuba Japan /1996	Academic	2048	**368.2** 614	103680 30720
19	SGI T3E	Max-Planck-Gesellschaft MPI/IPP Garching Germany /1997	Research	812	**355.1** 487.2	. .
20	IBM SP Power3 200 MHz	National Centers for Environmental Prediction Camp Spring USA /1999	Research Weather	768	**350.4** 614	113000 30000

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
21	SGI T3E900	Forschungszentrum Juelich (FZJ) Juelich Germany /1999	Research	540	**341.3** 486	. .
22	SGI T3E900	HWW/Universitaet Stuttgart Stuttgart Germany /1996	Industry	540	**341.3** 486	. .
23	SGI T3E900	Pittsburgh Supercomputer Center Pittsburgh USA /1998	Research	540	**341.3** 486	. .
24	SGI T3E1200	Government USA /1999	Classified	404	**334.7** 484.8	. .
25	IBM SP Power3 200 MHz	IBM Poughkeepsie USA /1999	Vendor	512	**287.84** 409	140000 30000
26	Fujitsu VPP700/128E	Institute of Physical and Chemical Res. (RIKEN) Wako Japan /1999	Research	128	**268.9** 307.2	166400 23040
27	SGI ORIGIN 2000 195/250 MHz	NCSA Urbana-Champaign USA /1998	Research	1024	**264.9** 327.68	. .
28	Hitachi SR8000/36	Meteorological Research Institute Japan /1999	Research Weather	36	**255.9** 288	69000 5968
29	NEC SX-4/128M4	Atmospheric Environment Service (AES) Dorval Canada /1998	Research Weather	128	**244** 256	. .
30	NEC SX-4/128H4	Tohoku University Aramaki Japan /1997	Academic	128	**244** 256	. .
31	SGI T3E1200	Government USA /1999	Classified	284	**235** 340.8	. .
32	SGI T3E	Forschungszentrum Juelich (FZJ) Juelich Germany /1996	Research	540	**234.9** 324	86400 14400
33	SGI T3E	Silicon Graphics Eagan USA /1997	Vendor	540	**234.9** 324	86400 14400
34	Hitachi SR2201/1024	University of Tokyo Tokyo Japan /1996	Academic	1024	**232.4** 307	155520 34560
35	Fujitsu Numerical Wind Tunnel	NAL Japan /1996	Research Aerospace	167	**229.7** 281	66132 18018
36	SGI T3E1200	CINECA Bologna Italy /1999	Academic	268	**221.77** 321.6	. .
37	SGI T3E1200	Government USA /1998	Classified	268	**221.77** 321.6	. .
38	SGI T3E1200	US Army HPC Research Center at NCS Minneapolis USA /1997	Research	268	**221.77** 321.6	. .
39	SGI T3E900	University of Edinburgh Edinburgh UK /1997	Academic	348	**218.9** 313.2	. .
40	Fujitsu VPP700/116	ECMWF Reading UK /1997	Research Weather	116	**213** 255.2	111360 18560

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
41	IBM ASCI Blue Pacific TR SP Silver	Lawrence Livermore National Laboratory Livermore USA /1998	Research Energy	672	**198.6** 446	95000 37000
42	IBM SP P2SC 120/135 MHz	Pacific Northwest National Laboratory Richland USA /1998	Research	512	**180.906** 248.32	62000 .
43	IBM SP Power3 200 MHz	Nichols Research Corp. Vicksburg USA /1999	Industry Defense	304	**175.3** 243	. .
44	SGI T3E900	Minnesota Supercomputer Center USA /1997	Industry	268	**169.07** 241.2	. .
45	SGI T3E900	University of Alaska - ARSC Fairbanks USA /1999	Academic	268	**169.07** 241.2	. .
46	SGI T3E900	ZIB/Konrad Zuse-Zentrum fuer Informationstechnik Berlin Germany /1999	Academic	268	**169.07** 241.2	. .
47	SGI T3E750	Commissariat a l'Energie Atomique (CEA) Grenoble France /1997	Research Energy	300	**157.5** 225	. .
48	IBM SP PC604 332 MHz	IBM Poughkeepsie USA /1998	Vendor	512	**156.8** 329.9	125000 27000
49	Compaq AlphaServer SC256	Compaq Computer Corporation Littleton USA /1995	Vendor Benchmarking	256	**154.4** 256	120000 26000
50	IBM SP Power3 200 MHz	RIPS Tsukuba Japan /1999	Research	256	**149.36** 205	100000 18500
51	Hitachi SR8000/20	Institute of Statistical Mathematics Tokyo Japan /1999	Research	20	**144.5** 160	48000 4000
52	Intel XP/S-MP 150	Oak Ridge National Laboratory Oak Ridge USA /1995	Research	3072	**127.1** 154	86000 17800
53	SGI T3E750	CSC (Center for Scientific Computing) Espoo Finland /1997	Academic	236	**123.98** 177	. .
54	Sun HPC 10000 333 MHz	Sun Portland USA /1998	Vendor	256	**123.9** 170.4	80640 26880
55	NEC SX-4/64M2	National Institute of Fusion Science (NIFS) Japan /1997	Research	64	**122.2** 128	30080 4352
56	NEC SX-4/64M2	Osaka University Osaka Japan /1997	Academic	64	**122.2** 128	30080 4352
57	SGI T3E	CNRS/IDRIS Orsay France /1996	Academic	268	**117.9** 160.8	. .
58	SGI T3E	Government USA /1997	Classified	268	**117.9** 160.8	. .
59	SGI T3E	UCSD/San Diego Supercomputer Center San Diego USA /1996	Academic	268	**117.9** 160.8	. .
60	SGI T3E750	Government USA /1997	Classified	220	**115.44** 165	. .

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61	Fujitsu VPP700/56	Kyushu University Fukuoka Japan /1996	Academic	56	**110.3** 123.2	109200 10752
62	IBM SP P2SC 160 MHz	Atomic Weapons Establishment Aldermaston UK /1999	Classified	252	**109.9** 161.2	. .
63	Fujitsu VPP500/80	National Lab. for High Energy Physics Japan /1994	Research	80	**109.8** 128	46400 11030
64	SGI T3E1200	National Institute for Water and Atmospheric Resea Wellington New Zealand /1999	Research Weather	132	**109.3** 158.4	. .
65	IBM SP PC604 332 MHz	FUNB USA /1999	Industry	352	**108.2** 233.6	. .
66	Fujitsu/SNI VPP700/52	Leibniz Rechenzentrum Muenchen Germany /1998	Academic	52	**106.3** 114.4	. .
67	IBM SP P2SC 160 MHz	Maui High-Performance Computing Center (MHPCC) USA /1998	Research	243	**106.115** 155.52	. .
68	Intel XP/S-MP 125	Japan Atomic Energy Research Japan /1996	Research	2502	**103.5** 125.1	. .
69	SGI ORIGIN 2000 250 MHz	NASA/Ames Research Center/NAS Mountain View USA /1998	Research Aerospace	256	**101.4** 128	86400 13248
70	SGI T3D MC1024-8	Government USA /1994	Classified	1024	**100.5** 152	81920 10224
71	SGI T3E	National Supercomputer Centre (NSC) Linkoping Sweden /1997	Academic	228	**99.7** 136.8	. .
72	Fujitsu VPP700/48E	ECMWF Reading UK /1998	Research Weather	48	**97.5** 115.2	. .
73	IBM SP Power3 200 MHz	University of Minnesota/Supercomputing Institute Minneapolis USA /1999	Academic	160	**94.9** 128	. .
74	IBM SP P2SC 135 MHz	DOD/CEWES Vicksburg USA /1997	Research	256	**94.19** 138.24	. .
75	IBM SP P2SC 135 MHz	Wright-Patterson Air Force Base USA /1997	Research	256	**94.19** 138.24	. .
76	IBM SP PC604 332 MHz	British Airways UK /1999	Industry	302	**93.1** 200.4	. .
77	SGI T3E750	Government USA /1997	Classified	172	**89.8** 129	. .
78	SGI T3E900	KIST/System Engineering Research Institute (SSC) Korea /1997	Industry	132	**82.15** 118.8	. .
79	IBM SP P2SC 160 MHz	State Farm USA /1998	Industry Database	186	**81.89** 123.5	. .
80	IBM SP P2SC 160 MHz	Western Geophysical London UK /1999	Industry Geophysics	186	**81.89** 123.5	. .

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81	IBM SP PC604 332 MHz	Charles Schwab USA /1998	Industry Finance	264	**81.5** 175	. .
82	SGI T3E	Commissariat a l'Energie Atomique (CEA) Limeil France /1997	Research	188	**81.36** 112.8	. .
83	IBM SP PC604 332 MHz	BASF Ludwigshafen Germany /1998	Industry Chemistry	256	**79.17** 169.9	89000 18000
84	IBM SP PC604 332 MHz	University of Minnesota/Supercomputing Institute Minneapolis USA /1998	Academic	256	**79.17** 169.9	89000 18000
85	IBM SP P2SC 120 MHz	State Farm USA /1998	Industry Database	242	**78.9** 116.16	. .
86	IBM SP P2SC 160 MHz	Government UK /1999	Classified	178	**78.4** 113.9	. .
87	NEC SX-4/40H2	HWW/Universitaet Stuttgart Stuttgart Germany /1999	Industry	40	**77.2** 80	. .
88	SGI ORIGIN 2000	Wright-Patterson Air Force Base USA /1999	Research	256	**76.9** 99.84	. .
89	SGI T3E	NRI for Earth Science and Disaster (NIED) Japan /1997	Research	172	**74.52** 103.2	. .
90	IBM SP Power3 200 MHz	Lockheed Martin USA /1999	Industry	124	**74.4** 99.2	. .
91	IBM SP Power3 200 MHz	Oak Ridge National Laboratory Oak Ridge USA /1999	Research	124	**74.4** 99.2	. .
92	IBM SP PC604 332 MHz	Chase Manhattan New York USA /1999	Industry Finance	232	**71.9** 153	. .
93	IBM SP PC604 332 MHz	Sprint USA /1999	Industry Telecomm	224	**69.5** 148	. .
94	IBM SP2/402	Chip Manufacturer (B) USA /1997	Industry Electronics	402	**69.33** 106.53	. .
95	IBM SP P2SC 120 MHz	CNUSC Montpellier France /1999	Academic	207	**67.8** 99.36	. .
96	IBM SP P2SC 160 MHz	KTH - Royal Institute of Technology Stockholm Sweden /1998	Research	146	**64.8** 93.44	. .
97	SGI T3E	Government USA /1997	Classified	148	**64.26** 88.8	. .
98	SGI ORIGIN 2000	Sandia National Labs Albuquerque USA /1997	Research	208	**63.1** 81.12	. .
99	SGI ORIGIN 2000 300 MHz	CSC (Centre for Sientific Computing) Espoo Finland /1999	Academic	128	**62.25** 76.8	60032 9000
100	SGI ORIGIN 2000 300 MHz	US Army Research Laboratory (ARL) Aberdeen USA /1999	Research	128	**62.25** 76.8	60032 9000

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101	SGI ORIGIN 2000 300 MHz	US Army Research Laboratory (ARL) Aberdeen USA /1999	Research	128	**62.25** 76.8	60032 9000
102	NEC SX-4/32	Bureau of Meterology Melbourne Australia /1997	Research Weather	32	**61.77** 64	20480 1688
103	NEC SX-4/32	NEC Fuchu Plant Tokyo Japan /1995	Vendor Benchmarking	32	**61.77** 64	20480 1688
104	NEC SX-4/32	National Institute for Environmental Studies Tsukuba Japan /1997	Research Environment	32	**61.77** 64	20480 1688
105	IBM SP PC604 332 MHz	Charles Schwab USA /1998	Industry Finance	192	**59.92** 127.44	. .
106	IBM SP PC604 332 MHz	Charles Schwab USA /1998	Industry Finance	192	**59.92** 127.44	. .
107	Fujitsu VPP500/42	Japan Atomic Energy Research Japan /1994	Research	42	**59.6** 67.2	. .
108	Fujitsu VPP500/42	Nagoya University Nagoya Japan /1995	Academic	42	**59.6** 67.2	. .
109	Hitachi SR2201/256	Hitachi Mechanical Engineering Res. Lab. Japan /1998	Research	256	**58.68** 77	77760 13440
110	Hitachi SR2201/256	Real World Computing (RWCP) Tokyo Japan /1997	Research	256	**58.68** 77	77760 13440
111	Hitachi SR2201/256	Tokyo University - Human Genome Center/IMS Tokyo Japan /1998	Academic	256	**58.68** 77	77760 13440
112	Hitachi SR2201/256	University of Cambridge Cambridge UK /1998	Academic	256	**58.68** 77	77760 13440
113	SGI ORIGIN 2000	Boston University Boston USA /1997	Academic	192	**58.6** 74.88	. .
114	SGI T3E	AWI (Alfred Wegener Institut) Bremerhaven Germany /1998	Research	134	**58.28** 80.4	. .
115	SGI T3E	Japan Adv. Inst. of Science and Technology (JAIST) Hokuriku Japan /1997	Academic	134	**58.28** 80.4	. .
116	Fujitsu VPP700/26E	Meteo-France Toulouse France /1997	Research Weather	26	**58** 62.4	74880 5200
117	IBM SP PC604 332 MHz	British Columbia Telecommunications Canada /1998	Industry Telecomm	184	**57.51** 122.13	. .
118	IBM SP PC604 332 MHz	ISSC UK /1999	Industry	184	**57.51** 122.13	. .
119	SGI T3E	Ohio Supercomputer Center Columbus USA /1997	Academic	132	**57.42** 79.2	. .
120	IBM SP P2SC 160 MHz	Oracle/IBM France /1998	Industry Database	128	**57.24** 81.92	39000 9180

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121	IBM SP P2SC 160 MHz	UCSD/San Diego Supercomputer Center San Diego USA /1997	Academic	128	**57.24** 81.92	39000 9180
122	Fujitsu VPP500/40	National Institute of Genetics Mishima Japan /1995	Research	40	**56.9** 64	. .
123	Fujitsu VPP500/40	Tokyo University - Inst. of Solid State Physics Tokyo Japan /1994	Academic	40	**56.9** 64	. .
124	IBM SP P2SC 160 MHz	Nichols Research Corp. Vicksburg USA /1998	Industry Defense	126	**56.37** 80.64	. .
125	SGI T3E1200	Environmental Protection Agency USA /1999	Research	68	**56.3** 81.6	. .
126	IBM SP P2SC 160 MHz	Government France /1999	Classified	124	**55.5** 79.3	. .
127	Sun HPC 450 Cluster	Sun Burlington USA /1998	Vendor	160	**55.44** 96	89600 22400
128	SGI T3E900	The Scripps Research Institute La Jolla USA /1997	Research	86	**54.6** 77.4	. .
129	Self-made CPlant Cluster	Sandia National Laboratories Albuquerque USA /1998	Research	150	**54.24** 150	. .
130	IBM SP P2SC 120 MHz	Cornell Theory Center Ithaca USA /1997	Academic	160	**52.96** 76.8	. .
131	IBM SP PC604 332 MHz	DeTeCSM Bonn Germany /1999	Industry	168	**52.7** 111.5	. .
132	IBM SP PC604 332 MHz	First USA USA /1999	Industry Finance	168	**52.7** 111.5	. .
133	SGI ONYX2 250 MHz	Argonne National Laboratory USA /1998	Research	128	**51.44** 64	61000 10000
134	SGI ORIGIN 2000 250 MHz	Computer Sciences Corporation (CSC) Farnborough UK /1998	Industry Aerospace	128	**51.44** 64	61000 10000
135	SGI ORIGIN 2000 250 MHz	DaimlerChrysler Detroit USA /1999	Industry Automotive	128	**51.44** 64	61000 10000
136	SGI ORIGIN 2000 250 MHz	DaimlerChrysler Detroit USA /1999	Industry Automotive	128	**51.44** 64	61000 10000
137	SGI ORIGIN 2000 250 MHz	Lockheed Martin USA /1998	Industry Aerospace	128	**51.44** 64	61000 10000
138	SGI ORIGIN 2000 250 MHz	Lockheed Martin USA /1998	Industry Aerospace	128	**51.44** 64	61000 10000
139	SGI ORIGIN 2000 250 MHz	Lockheed Martin USA /1998	Industry Aerospace	128	**51.44** 64	61000 10000
140	SGI ORIGIN 2000 250 MHz	Lockheed-GOODYEAR USA /1999	Industry	128	**51.44** 64	61000 10000

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
141	SGI ORIGIN 2000 250 MHz	Lockheed-GOODYEAR USA /1999	Industry	128	**51.44** 64	61000 10000
142	SGI ORIGIN 2000 250 MHz	Lockheed-GOODYEAR USA /1999	Industry	128	**51.44** 64	61000 10000
143	SGI ORIGIN 2000 250 MHz	NCAR (National Center for Atmospheric Research) Boulder USA /1998	Research	128	**51.44** 64	61000 10000
144	SGI ORIGIN 2000 250 MHz	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1999	Research Aerospace	128	**51.44** 64	61000 10000
145	SGI ORIGIN 2000 250 MHz	Naval Research Laboratory (NRL) Washington D.C. USA /1997	Research	128	**51.44** 64	61000 10000
146	SGI ORIGIN 2000 250 MHz	UNITE Netherlands /1999	Academic	128	**51.44** 64	61000 10000
147	SGI ORIGIN 2000 250 MHz	US Army Research Laboratory (ARL) Aberdeen USA /1999	Research	128	**51.44** 64	61000 10000
148	SGI ORIGIN 2000 250 MHz	White Sands Missile Range National Directorate White Sands USA /1998	Classified	128	**51.44** 64	61000 10000
149	IBM SP Power3 200 MHz	Volvo Gothenberg Sweden /1999	Industry Automotive	84	**51.4** 67.2	. .
150	Hewlett-Packard Exemplar X-Class	Caltech/JPL Pasadena USA /1997	Research	256	**51.3** 184.32	46128 .
151	Hewlett-Packard Exemplar X-Class	Hewlett-Packard CXTC Richardson USA /1997	Vendor Benchmarking	128	**51.3** 92.16	46128 .
152	IBM SP PC604 332 MHz	BASF Ludwigshafen Germany /1999	Industry Chemistry	162	**50.8** 107.5	. .
153	SGI T3D MC512-8	Los Alamos National Laboratory Los Alamos USA /1994	Research Energy	512	**50.8** 76	57856 7136
154	SGI T3D MC512-8	Minnesota Supercomputer Center USA /1995	Industry	512	**50.8** 76	57856 7136
155	SGI T3D MC512-8	Pittsburgh Supercomputing Center Pittsburgh USA /1994	Academic	512	**50.8** 76	57856 7136
156	SGI T3D MC512-8	University of Edinburgh Edinburgh UK /1996	Academic	512	**50.8** 76	57856 7136
157	IBM SP P2SC 120 MHz	Chip Manufacturer (A) USA /1997	Industry Electronics	152	**50.42** 72.96	. .
158	IBM SP PC604 332 MHz	Thyssen Germany /1999	Industry	160	**50.2** 106.2	. .
159	IBM SP PC604 332 MHz	Federal Express USA /1999	Industry Database	156	**49** 103.5	. .
160	Self-made Avalon Cluster	Los Alamos National Laboratory /CNLS Los Alamos USA /1998	Academic	140	**48.6** 149.4	62720 25200

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
161	NEC SX-4/25	NAL Japan /1997	Research	25	**48.35** 50	. .
162	SGI T932/321024	Automotive Manufacturer (A) Tokyo Japan /1995	Industry Automotive	32	**47.85** 58	. .
163	SGI T932/321024	Government USA /1996	Classified	32	**47.85** 58	. .
164	SGI T932/321024	Government USA /1997	Classified	32	**47.85** 58	. .
165	SGI T932/321024	Government USA /1998	Classified	32	**47.85** 58	. .
166	SGI T932/321024	NRI for Earth Science and Disaster (NIED) Japan /1997	Research	32	**47.85** 58	. .
167	SGI T932/321024	Nippon Telegraph and Telephone (NTT) Tokyo Japan /1995	Industry Telecomm	32	**47.85** 58	. .
168	SGI ORIGIN 2000 300 MHz	Lunds Tekniska Hvgskola Sweden /1999	Academic	100	**47.7** 60	. .
169	SGI T3E	EXXON USA /1998	Industry Geophysics	108	**47.1** 64.8	. .
170	Fujitsu VPP500/32	The Angstrom Technology Partnership Tsukuba Japan /1993	Research	32	**46.1** 51.2	29760 5350
171	Fujitsu VPP700/22	National Astronomical Observatory of Japan (NAOJ) Hilo USA /1999	Research	22	**45.9** 48.4	67320 4840
172	IBM SP PC604 332 MHz	APAC Hong Kong (EHU) Netherlands /1999	Industry	144	**45.4** 95.6	. .
173	IBM SP PC604 332 MHz	Alcatel France /1999	Industry	142	**44.8** 94.2	. .
174	IBM SP PC604 332 MHz	Atomic Weapons Establishment Aldermaston UK /1998	Classified	140	**44.27** 92.95	. .
175	IBM SP PC604 332 MHz	Sears USA /1998	Industry Database	140	**44.27** 92.95	. .
176	IBM SP2/256	Universitaet/Forschungszentrum Karlsruhe Karlsruhe Germany /1997	Academic	256	**44.2** 68	53000 13500
177	Sun HPC 10000 400 MHz	Baker Hughes Houston USA /1999	Industry Geophysics	64	**43.82** 51.2	39936 4032
178	Sun HPC 10000 400 MHz	Cincinnati Bell Information Systems (CBIS) Lake Mary USA /1999	Industry Telecomm	64	**43.82** 51.2	39936 4032
179	Sun HPC 10000 400 MHz	GTE Communications Fort Wayne USA /1999	Industry Telecomm	64	**43.82** 51.2	39936 4032
180	Sun HPC 10000 400 MHz	OfficeMax Shaker Heights USA /1999	Industry Database	64	**43.82** 51.2	39936 4032

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
181	Sun HPC 10000 400 MHz	Optus Communications Sydney Australia /1999	Industry Telecomm	64	**43.82** 51.2	39936 4032
182	Sun HPC 10000 400 MHz	Optus Communications Sydney Australia /1999	Industry Telecomm	64	**43.82** 51.2	39936 4032
183	Sun HPC 10000 400 MHz	US Army Research Laboratory (ARL) Aberdeen USA /1999	Research	64	**43.82** 51.2	39936 4032
184	Sun HPC 10000 400 MHz	W.W. Grainger Niles USA /1999	Industry Database	64	**43.82** 51.2	39936 4032
185	IBM SP PC604 332 MHz	Deutsche Bank Frankfurt Germany /1999	Industry Finance	136	**43.07** 90.2	. .
186	SGI T3E900	North Carolina Supercomputing Center (NCSC) USA /1998	Academic	66	**42.7** 59.4	. .
187	SGI T3E900	Phillips Petroleum Company Bartlesville USA /1997	Industry Geophysics	66	**42.7** 59.4	. .
188	NEC SX-4/22H5	VW (Volkswagen AG) Wolfsburg Germany /1999	Industry Automotive	22	**42.6** 44	. .
189	IBM SP PC604 332 MHz	Pennsylvania State University USA /1998	Academic	134	**42.47** 88.97	. .
190	IBM SP PC604 332 MHz	Deutsche Telekom AG Darmstadt Germany /1998	Industry Telecomm	132	**41.87** 87.64	. .
191	IBM SP PC604 332 MHz	State of Ohio USA /1998	Government	132	**41.87** 87.64	. .
192	IBM SP PC604 332 MHz	BASF Ludwigshafen Germany /1999	Industry Chemistry	130	**41.2** 86.3	. .
193	SGI T3E	Norwegian University of Science and Technology Trondheim Norway /1997	Academic	94	**41.15** 56.4	. .
194	IBM SP PC604 332 MHz	Government France /1999	Classified	128	**40.67** 84.99	63000 12000
195	IBM SP PC604 332 MHz	Motorola Scottsdale USA /1998	Industry Electronics	128	**40.67** 84.99	63000 12000
196	Fujitsu VPP500/28	Institute of Physical and Chemical Res. (RIKEN) Wako Japan /1993	Research	28	**40.475** 44.8	. .
197	IBM SP P2SC 160 MHz	Korea Telecom Korea /1998	Industry Telecomm	89	**40.3** 56.96	. .
198	SGI ORIGIN 2000	DOD/CEWES Vicksburg USA /1998	Research	128	**40.25** 49.92	60000 6000
199	SGI ORIGIN 2000	Kyoto University Kyoto Japan /1997	Academic	128	**40.25** 49.92	60000 6000
200	SGI ORIGIN 2000	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1997	Research Aerospace	128	**40.25** 49.92	60000 6000

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
201	SGI Onyx2	Silicon Graphics Mountain View USA /1998	Vendor Software	128	**40.25** 49.92	60000 6000
202	SGI ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1998	Research	128	**40.25** 49.92	60000 6000
203	SGI ORIGIN 2000	University of Bergen Bergen Norway /1997	Academic	128	**40.25** 49.92	60000 6000
204	SGI ORIGIN 2000	University of Minnesota/Supercomputing Institute Minneapolis USA /1998	Academic	128	**40.25** 49.92	60000 6000
205	SGI ORIGIN 2000	University of Tokyo Tokyo Japan /1997	Academic	128	**40.25** 49.92	60000 6000
206	SGI ORIGIN 2000	University of Tokyo Tokyo Japan /1997	Academic	128	**40.25** 49.92	60000 6000
207	SGI ORIGIN 2000	Vertex Pharmaceuticals Cambridge USA /1997	Industry Pharmaceutics	128	**40.25** 49.92	60000 6000
208	SGI ORIGIN 2000	Wright-Patterson Air Force Base USA /1998	Research	128	**40.25** 49.92	60000 6000
209	SGI ORIGIN 2000	Wright-Patterson Air Force Base USA /1999	Research	128	**40.25** 49.92	60000 6000
210	SGI T932/261024	NOAA/Geophysical Fluid Dynamics Laboratory (GFDL) Princeton USA /1997	Research Weather	26	**40.25** 47.12	. .
211	SGI T932/261024	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1998	Research	26	**40.25** 47.12	. .
212	IBM SP Power3 200 MHz	Aetna Life Insurance Middletown USA /1999	Industry Database	64	**39.9** 51.2	63000 7400
213	IBM SP PC604 332 MHz	Deutsche Telekom AG Darmstadt Germany /1998	Industry Telecomm	124	**39.43** 82.33	. .
214	IBM SP PC604 332 MHz	Dickens/FM USA /1999	Industry	124	**39.43** 82.33	. .
215	IBM SP2/224	Maui High-Performance Computing Center (MHPCC) USA /1994	Research	224	**39.03** 59.58	. .
216	SGI T3E900	Government USA /1998	Classified	60	**38.93** 54.13	. .
217	SGI ORIGIN 2000 250 MHz	Allied Signal Federal ManufacturingTechnologies Kansas City USA /1998	Industry Manufacturing	96	**38.84** 48	. .
218	SGI ORIGIN 2000 250 MHz	Lockheed Martin Energy Systems/ORNL Y-12 Oak Ridge USA /1998	Industry Mechanics	96	**38.84** 48	. .
219	SGI ORIGIN 2000 250 MHz	Silicon Graphics Mountain View USA /1999	Vendor	96	**38.84** 48	. .
220	NEC SX-4/20	Japan Marine Science and Technology Yokosuka Japan /1995	Research	20	**38.76** 40	. .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
221	NEC SX-4/20	National Research Institute for Metals Tsukuba Japan /1996	Research	20	**38.76** 40	. .
222	NEC SX-4/20	Toyota Central Research Development Japan /1996	Industry Automotive	20	**38.76** 40	. .
223	Fujitsu VPP700/17E	Communications Res. Lab. (CRL) Tokyo Japan /1998	Research	17	**38.56** 40.8	. .
224	Sun HPC 10000 400 MHz	Mannesmann Mobilfunk Ratingen Germany /1999	Industry Telecomm	56	**38.53** 44.8	39936 3456
225	Sun HPC 10000 400 MHz	Mannesmann Mobilfunk Ratingen Germany /1999	Industry Telecomm	56	**38.53** 44.8	39936 3456
226	Sun HPC 6000 "Wildfire"	Naval Research Laboratory (NRL) Washington D.C. USA /1998	Research	96	**38.13** 48	29568 8064
227	IBM SP PC604 332 MHz	VF Services USA /1999	Industry	120	**38.1** 79.6	. .
228	IBM SP PC604 332 MHz	Western Geophysical Houston USA /1999	Industry Geophysics	120	**38.1** 79.6	. .
229	SGI T3E	Technical University Delft (TUD) Delft Netherlands /1997	Academic	86	**37.73** 51.6	. .
230	SGI T3E	University of Texas Austin USA /1997	Academic	86	**37.73** 51.6	. .
231	SGI ORIGIN 2000 250 MHz - Eth-Cluster	Government USA /1998	Classified	144	**37.31** 72	. .
232	SGI T932/24512	Commissariat a l'Energie Atomique (CEA) Limeil France /1997	Research	24	**37.21** 43.5	. .
233	SGI T932/241024	Ford Motor Company Dearborn USA /1996	Industry Automotive	24	**37.21** 43.5	. .
234	IBM SP PC604 332 MHz	TRW Cleveland USA /1999	Industry Automotive	116	**36.9** 77	. .
235	IBM SP PC604 332 MHz	Whirlpool USA /1999	Industry	116	**36.9** 77	. .
236	Fujitsu VPP300/16E	Audi AG Ingolstadt Germany /1998	Industry Automotive	16	**36.4** 38.4	57600 3520
237	IBM SP PC604 332 MHz	Deutsche Telekom AG Darmstadt Germany /1998	Industry Telecomm	112	**35.71** 74.36	. .
238	IBM SP PC604 332 MHz	Philips Lightning Netherlands /1998	Industry Electronics	112	**35.71** 74.36	. .
239	IBM SP P2SC 160 MHz	SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1998	Research	76	**35.54** 48.64	. .
240	SGI ORIGIN 2000	Chalmers University of Technology Goteborg Sweden /1999	Academic	110	**34.7** 42.9	. .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
241	Sun HPC 10000 400 MHz	Pratt and Whitney Hartford USA /1999	Industry	50	**34.46** 40	. .
242	IBM SP PC604 332 MHz	Cable Wireless USA /1999	Industry	108	**34.4** 71.7	. .
243	Sun HPC 10000 333 MHz	ATT Alpharetta USA /1998	Industry Telecomm	64	**34.17** 42.6	20352 3648
244	Sun HPC 10000 333 MHz	Ameritrade Inc. Omaha USA /1999	Industry Finance	64	**34.17** 42.6	20352 3648
245	Sun HPC 10000 333 MHz	Baker Hughes Houston USA /1998	Industry Geophysics	64	**34.17** 42.6	20352 3648
246	Sun HPC 10000 333 MHz	Bank Frankfurt Germany /1999	Industry Finance	64	**34.17** 42.6	20352 3648
247	Sun HPC 10000 333 MHz	Cedel Bank Grande Duchesse Luxembourg /1999	Industry Finance	64	**34.17** 42.6	20352 3648
248	Sun HPC 10000 333 MHz	Commerzbank Germany /1998	Industry Finance	64	**34.17** 42.6	20352 3648
249	Sun HPC 10000 333 MHz	Commerzbank Germany /1998	Industry Finance	64	**34.17** 42.6	20352 3648
250	Sun HPC 10000 333 MHz	Commerzbank Germany /1998	Industry Finance	64	**34.17** 42.6	20352 3648
251	Sun HPC 10000 333 MHz	Commerzbank Germany /1998	Industry Finance	64	**34.17** 42.6	20352 3648
252	Sun HPC 10000 333 MHz	Commerzbank Germany /1998	Industry Finance	64	**34.17** 42.6	20352 3648
253	Sun HPC 10000 333 MHz	Deutsche Morgan Grenfell London UK /1998	Industry Finance	64	**34.17** 42.6	20352 3648
254	Sun HPC 10000 333 MHz	Deutsche Morgan Grenfell London UK /1998	Industry Finance	64	**34.17** 42.6	20352 3648
255	Sun HPC 10000 333 MHz	EDS/ SAP Plano Australia /1999	Industry Finance	64	**34.17** 42.6	20352 3648
256	Sun HPC 10000 333 MHz	Ford Motor Company Dearborn USA /1999	Industry Automotive	64	**34.17** 42.6	20352 3648
257	Sun HPC 10000 333 MHz	GTE Communications Temple Terrace USA /1999	Industry Telecomm	64	**34.17** 42.6	20352 3648
258	Sun HPC 10000 333 MHz	Hughes Space Communication El Segundo USA /1999	Industry Aerospace	64	**34.17** 42.6	20352 3648
259	Sun HPC 10000 333 MHz	Mississippi State University Starkville USA /1998	Academic	64	**34.17** 42.6	20352 3648
260	Sun HPC 10000 333 MHz	Motorola Scottsdale USA /1999	Industry Electronics	64	**34.17** 42.6	20352 3648

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
261	Sun HPC 10000 333 MHz	National Center for Genome Resources Santa Fe USA /1998	Research	64	**34.17** 42.6	20352 3648
262	Sun HPC 10000 333 MHz	Nippon Telegraph and Telephone (NTT) Kanagawa Japan /1998	Industry Telecomm	64	**34.17** 42.6	20352 3648
263	Sun HPC 10000 333 MHz	Nippon Telegraph and Telephone (NTT) Kanagawa Japan /1998	Industry Telecomm	64	**34.17** 42.6	20352 3648
264	Sun HPC 10000 333 MHz	Omnitel Pronto Italia Milano Italy /1999	Industry Telecomm	64	**34.17** 42.6	20352 3648
265	Sun HPC 10000 333 MHz	Owens Corning Toledo USA /1998	Industry Chemistry	64	**34.17** 42.6	20352 3648
266	Sun HPC 10000 333 MHz	Owens Corning Toledo USA /1998	Industry Chemistry	64	**34.17** 42.6	20352 3648
267	Sun HPC 10000 333 MHz	RIPS Ibarakiken Japan /1999	Research	64	**34.17** 42.6	20352 3648
268	Sun HPC 10000 333 MHz	Recruit Tokyo Japan /1999	Industry WWW	64	**34.17** 42.6	20352 3648
269	SGI ORIGIN 2000	National Research Counsel Canada /1999	Research	108	**34.15** 42.12	. .
270	Fujitsu VPP300/16	Japan Atomic Energy Research Japan /1996	Research	16	**34.1** 35.2	59200 3520
271	Fujitsu VPP300/16	Japan Science and Technology Tokyo Japan /1996	Research	16	**34.1** 35.2	59200 3520
272	Fujitsu VPP300/16	Reactor Nuclear Fuel Development Japan /1996	Research	16	**34.1** 35.2	59200 3520
273	Fujitsu/SNI VPP300/16	Universitaet/Forschungszentrum Karlsruhe Karlsruhe Germany /1997	Academic	16	**34.1** 35.2	59200 3520
274	IBM SP P2SC 120 MHz	Dassault Aviation France /1999	Industry Aerospace	100	**33.9** 48	. .
275	IBM SP P2SC 120 MHz	UNI-C Lyngby Denmark /1999	Academic	100	**33.9** 48	. .
276	Intel XP/S-MP 41	Rome Laboratory USA /1995	Research	816	**33.7** 40.8	. .
277	IBM SP PC604 332 MHz	Nabisco USA /1999	Industry	104	**33.2** 69	. .
278	Sun HPC 10000 400 MHz	Bank USA /1999	Industry Finance	48	**33.09** 38.4	39936 3072
279	Sun HPC 10000 400 MHz	Fannie Mae Mortgage Washington DC USA /1999	Industry Finance	48	**33.09** 38.4	39936 3072
280	Sun HPC 10000 400 MHz	One2One London UK /1999	Industry Telecomm	48	**33.09** 38.4	39936 3072

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
281	Sun HPC 10000 400 MHz	Pratt and Whitney Hartford USA /1999	Industry	48	**33.09** 38.4	39936 3072
282	Sun HPC 10000 400 MHz	Pratt and Whitney Hartford USA /1999	Industry	48	**33.09** 38.4	39936 3072
283	Sun HPC 10000 400 MHz	Sonopress Inc Weaverville USA /1999	Industry	48	**33.09** 38.4	39936 3072
284	Sun HPC 10000 400 MHz	The Sabre Group Ft Worth USA /1999	Industry Transportation	48	**33.09** 38.4	39936 3072
285	Sun HPC 10000 333 MHz	Wright-Patterson Air Force Base/NAIC USA /1998	Research	61	**32.745** 40.66	. .
286	IBM SP PC604 332 MHz	Electrabel Belgium /1999	Industry	102	**32.6** 67.7	. .
287	Sun HPC 10000 400 MHz	Texas Instruments Lewisville USA /1999	Industry Electronics	46	**32.39** 36.8	. .
288	Sun HPC 10000 333 MHz	ATT CFO Orlando USA /1998	Industry Telecomm	60	**32.27** 40	20352 3456
289	Sun HPC 10000 333 MHz	Bell Canada Montreal Canada /1998	Industry Telecomm	60	**32.27** 40	20352 3456
290	IBM SP P2SC 120 MHz	Argonne National Laboratory USA /1996	Research	94	**32.05** 45.12	. .
291	IBM SP PC604 332 MHz	Lincoln Electric Cleveland USA /1998	Industry Electronics	100	**31.99** 66.4	. .
292	Hewlett-Packard V2500	CILEA Milano Italy /1999	Research	32	**31.59** 56.3	41000 4720
293	Hewlett-Packard V2500	DSC (SEA) USA /1999	Classified	32	**31.59** 56.3	41000 4720
294	Hewlett-Packard V2500	DeTeCSM Bonn Germany /1999	Industry	32	**31.59** 56.3	41000 4720
295	Hewlett-Packard V2500	DeTeCSM Bonn Germany /1999	Industry	32	**31.59** 56.3	41000 4720
296	Hewlett-Packard V2500	DeTeCSM Bonn Germany /1999	Industry	32	**31.59** 56.3	41000 4720
297	Hewlett-Packard V2500	DeTeCSM Bonn Germany /1999	Industry	32	**31.59** 56.3	41000 4720
298	Hewlett-Packard V2500	DeTeCSM Bonn Germany /1999	Industry	32	**31.59** 56.3	41000 4720
299	Hewlett-Packard V2500	DeTeCSM Bonn Germany /1999	Industry	32	**31.59** 56.3	41000 4720
300	Hewlett-Packard V2500	Fairchild Semiconductors USA /1999	Industry	32	**31.59** 56.3	41000 4720

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N $_{world}$	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
301	Hewlett-Packard V2500	Honda of America USA /1999	Industry Automotive	32	**31.59** 56.3	41000 4720
302	Hewlett-Packard V2500	Honda of America USA /1999	Industry Automotive	32	**31.59** 56.3	41000 4720
303	Hewlett-Packard V2500	Honda of America USA /1999	Industry Automotive	32	**31.59** 56.3	41000 4720
304	Hewlett-Packard V2500	Honeywell USA /1999	Industry	32	**31.59** 56.3	41000 4720
305	Hewlett-Packard V2500	I2 Technologies Inc. USA /1999	Industry	32	**31.59** 56.3	41000 4720
306	Hewlett-Packard V2500	I2 Technologies Inc. USA /1999	Industry	32	**31.59** 56.3	41000 4720
307	Hewlett-Packard V2500	I2 Technologies Inc. USA /1999	Industry	32	**31.59** 56.3	41000 4720
308	Hewlett-Packard V2500	I2 Technologies Inc. USA /1999	Industry	32	**31.59** 56.3	41000 4720
309	Hewlett-Packard V2500	I2 Technologies Inc. USA /1999	Industry	32	**31.59** 56.3	41000 4720
310	Hewlett-Packard V2500	I2 Technologies Inc. USA /1999	Industry	32	**31.59** 56.3	41000 4720
311	Hewlett-Packard V2500	Pacific Bell USA /1999	Industry	32	**31.59** 56.3	41000 4720
312	Hewlett-Packard V2500	Pacific Bell USA /1999	Industry	32	**31.59** 56.3	41000 4720
313	Hewlett-Packard V2500	Raytheon USA /1999	Industry	32	**31.59** 56.3	41000 4720
314	Hewlett-Packard V2500	Tabacalera Madrid Spain /1999	Industry	32	**31.59** 56.3	41000 4720
315	Hewlett-Packard V2500	The Sabre Group Ft Worth USA /1999	Industry Transportation	32	**31.59** 56.3	41000 4720
316	Hewlett-Packard V2500	The Sabre Group Ft Worth USA /1999	Industry Transportation	32	**31.59** 56.3	41000 4720
317	Hewlett-Packard V2500	The Sabre Group Ft Worth USA /1999	Industry Transportation	32	**31.59** 56.3	41000 4720
318	Hewlett-Packard V2500	The Sabre Group Ft Worth USA /1999	Industry Transportation	32	**31.59** 56.3	41000 4720
319	Hewlett-Packard V2500	The Sabre Group Ft Worth USA /1999	Industry Transportation	32	**31.59** 56.3	41000 4720
320	Hewlett-Packard V2500	United Airlines USA /1999	Industry	32	**31.59** 56.3	41000 4720

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
321	Hewlett-Packard V2500	United Airlines USA /1999	Industry	32	**31.59** 56.3	41000 4720
322	IBM SP PC604 332 MHz	ICAM/Alcatel France /1998	Industry	98	**31.37** 65.06	. .
323	SGI ORIGIN 2000 - Eth-Cluster	Automotive Manufacturer Japan /1997	Industry Automotive	128	**31.36** 49.92	. .
324	SGI ORIGIN 2000 - Eth-Cluster	BMW AG Muenchen Germany /1998	Industry Automotive	160	**31.36** 49.92	. .
325	SGI ORIGIN 2000 - Eth-Cluster	Walt Disney Feature Animation USA /1997	Industry	128	**31.36** 49.92	56000 21000
326	SGI ORIGIN 2000 300 MHz	CINECA Bologna Italy /1999	Academic	64	**31.33** 38.4	42496 6200
327	SGI ORIGIN 2000 300 MHz	Cambridge University Cambridge UK /1999	Academic	64	**31.33** 38.4	42496 6200
328	SGI ORIGIN 2000 300 MHz	Ford Motor Company USA /1998	Industry Automotive	64	**31.33** 38.4	42496 6200
329	SGI ORIGIN 2000 300 MHz	NASA/Ames Research Center/NAS/DAO Mountain View USA /1999	Research	64	**31.33** 38.4	42496 6200
330	SGI ORIGIN 2000 300 MHz	Silicon Graphics Eagan USA /1999	Vendor	64	**31.33** 38.4	42496 6200
331	SGI ORIGIN 2000 300 MHz	Silicon Graphics Eagan USA /1999	Vendor	64	**31.33** 38.4	42496 6200
332	SGI ORIGIN 2000 300 MHz	Silicon Graphics Eagan USA /1999	Vendor	64	**31.33** 38.4	42496 6200
333	SGI ORIGIN 2000 300 MHz	Silicon Graphics Eagan USA /1999	Vendor	64	**31.33** 38.4	42496 6200
334	SGI ORIGIN 2000 300 MHz	Silicon Graphics Eagan USA /1999	Vendor	64	**31.33** 38.4	42496 6200
335	SGI ORIGIN 2000 300 MHz	UNI-C/Aarhus Copenhagen Denmark /1999	Academic	64	**31.33** 38.4	42496 6200
336	NEC SX-4/16	Danish Meteorological Institute Copenhagen Denmark /1997	Research	16	**31.1** 32	20480 960
337	NEC SX-4/16	National Aerospace Laboratory (NLR) Noordoostpolder Netherlands /1996	Research Aerospace	16	**31.1** 32	20480 960
338	NEC SX-4/16	National Cardiovascular Center Japan /1996	Research	16	**31.1** 32	20480 960
339	NEC SX-4/16	Swiss Scientific Computing Center (CSCS) Manno Switzerland /1996	Research	16	**31.1** 32	20480 960
340	Compaq AlphaServer 8400 Cluster	Sandia National Labs Albuquerque USA /1997	Research	84	**30.9** 102.9	30704 8360

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
341	Compaq AlphaServer 8400 Cluster	Lawrence Livermore National Laboratory Livermore USA /1998	Research	80	**30.9** 98	30704 8360
342	IBM SP PC604 332 MHz	Atomic Weapons Establishment Aldermaston UK /1999	Classified	96	**30.75** 63.74	. .
343	IBM SP PC604 332 MHz	Autozone Memphis USA /1999	Industry Database	96	**30.75** 63.74	. .
344	IBM SP PC604 332 MHz	Bayer AG Germany /1999	Industry Chemistry	96	**30.75** 63.74	. .
345	IBM SP PC604 332 MHz	GTE Communications USA /1998	Industry Telecomm	96	**30.75** 63.74	. .
346	IBM SP PC604 332 MHz	Online Computer Library Center (OCLC) USA /1999	Academic	96	**30.75** 63.74	. .
347	IBM SP PC604 332 MHz	Prudential Insurance USA /1998	Industry Finance	96	**30.75** 63.74	. .
348	IBM SP PC604 332 MHz	SAP USA /1998	Industry Software	96	**30.75** 63.74	. .
349	SGI ORIGIN 2000 250 MHz - Eth-Cluster	America On Line (AOL) USA /1999	Industry	96	**30.7** 48	49000 17000
350	SGI ORIGIN 2000 250 MHz - Eth-Cluster	NIST - US Department of Commerce Gaithersburg USA /1999	Research	96	**30.7** 48	49000 17000
351	SGI ORIGIN 2000 250 MHz - Eth-Cluster	Raytheon-GARLAND USA /1998	Industry	96	**30.7** 48	49000 17000
352	SGI T932/202048	Automotive Manufacturer (B) Japan /1995	Industry Automotive	20	**30.62** 36.25	. .
353	SGI ORIGIN 2000	University of Utah Salt Lake City USA /1998	Academic	96	**30.5** 37.44	. .
354	SGI ORIGIN 2000	Vastar Houston USA /1997	Industry Geophysics	96	**30.5** 37.44	. .
355	Siemens hpcLine Cluster	Universitaet Paderborn - PC2 Paderborn Germany /1999	Academic	192	**30.4** 86.4	71040 14208
356	IBM SP P2SC 160 MHz	TRW Cleveland USA /1998	Industry Automotive	66	**30.31** 42.24	. .
357	Sun HPC 10000 333 MHz	Bell Canada Toronto Canada /1998	Industry Telecomm	56	**30.27** 37.29	20352 3264
358	Sun HPC 10000 333 MHz	Lexis Nexis Miamisburg USA /1998	Industry Infor. Service	56	**30.27** 37.29	20352 3264
359	Sun HPC 10000 333 MHz	Lexis Nexis Miamisburg USA /1999	Industry Infor. Service	56	**30.27** 37.29	20352 3264
360	Sun HPC 10000 333 MHz	Library of Congress Washington DC USA /1999	Government Database	56	**30.27** 37.29	20352 3264

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
361	Sun HPC 10000 333 MHz	RCN Inc. Merrifield USA /1999	Industry Telecomm	56	**30.27** 37.29	20352 3264
362	Self-made Parnass2 Cluster	University Bonn - Dep. of Applied Mathematics Bonn Germany /1999	Academic	128	**29.6** 51.2	53000 6600
363	IBM SP PC604 332 MHz	Bank One USA /1999	Industry Finance	92	**29.5** 61	. .
364	IBM SP PC604 332 MHz	Government France /1999	Classified	92	**29.5** 61	. .
365	IBM SP P2SC 160 MHz	Chip Manufacturer (D) USA /1999	Industry Electronics	64	**29.45** 40.96	27500 5700
366	IBM SP P2SC 160 MHz	EP Company (A) USA /1998	Industry Geophysics	64	**29.45** 40.96	27500 5700
367	IBM SP P2SC 160 MHz	EP Company (A) USA /1998	Industry Geophysics	64	**29.45** 40.96	27500 5700
368	IBM SP P2SC 160 MHz	EP Company (A) USA /1998	Industry Geophysics	64	**29.45** 40.96	27500 5700
369	IBM SP P2SC 160 MHz	EP Company (A) USA /1998	Industry Geophysics	64	**29.45** 40.96	27500 5700
370	IBM SP P2SC 160 MHz	EP Company (A) USA /1998	Industry Geophysics	64	**29.45** 40.96	27500 5700
371	IBM SP P2SC 160 MHz	ETH Zuerich Switzerland /1999	Research	64	**29.45** 40.96	27500 5700
372	IBM SP P2SC 160 MHz	Government UK /1999	Classified	64	**29.45** 40.96	27500 5700
373	IBM SP P2SC 160 MHz	Government UK /1999	Classified	64	**29.45** 40.96	27500 5700
374	Sun HPC 10000 333 MHz	France Telecom Savigny France /1999	Industry Telecomm	54	**29.29** 35.96	. .
375	Sun HPC 10000 333 MHz	SMVG Bern Switzerland /1998	Industry Finance	54	**29.29** 35.96	. .
376	IBM SP P2SC 135 MHz	Western Geophysical London UK /1998	Industry Geophysics	76	**29.24** 40.5	. .
377	SGI T3E	EDS/General Motors Auburn Hills USA /1996	Industry Automotive	66	**29.16** 39.6	. .
378	SGI T3E	Government USA /1999	Classified	66	**29.16** 39.6	. .
379	IBM SP P2SC 120 MHz	UKI IS UK /1998	Industry	84	**29.07** 40.32	. .
380	Sun HPC 10000 400 MHz	Information Systems Management (BC) Canada /1999	Industry Infor. Service	42	**28.94** 33.6	. .

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
381	IBM SP P2SC 160 MHz	Georgia Institute of Technology Atlanta USA /1997	Research	62	**28.54** 39.68	. .
382	Hitachi S-3800/480	Hitachi Ltd. GPCD Japan /1994	Vendor Software	4	**28.4** 32	15500 830
383	Hitachi S-3800/480	Japan Meteorological Agency Japan /1995	Research Weather	4	**28.4** 32	15500 830
384	Sun HPC 10000 333 MHz	Bell Canada Toronto Canada /1998	Industry Telecomm	52	**28.32** 34.632	20352 3072
385	Sun HPC 10000 333 MHz	BellSouth Birmingham USA /1999	Industry Telecomm	52	**28.32** 34.632	20352 3072
386	Sun HPC 10000 333 MHz	Commerzbank Frankfurt Germany /1998	Industry Finance	52	**28.32** 34.632	20352 3072
387	Sun HPC 10000 333 MHz	Glaxo Wellcome Raleigh USA /1999	Industry Pharmaceutics	52	**28.32** 34.632	20352 3072
388	Sun HPC 10000 333 MHz	KPMG Peat Marwick Montvale USA /1998	Industry Finance	52	**28.32** 34.632	20352 3072
389	Sun HPC 10000 333 MHz	RCN Inc. Merrifield USA /1999	Industry Telecomm	52	**28.32** 34.632	20352 3072
390	Sun HPC 10000 333 MHz	RCN Inc. Merrifield USA /1999	Industry Telecomm	52	**28.32** 34.632	20352 3072
391	SGI T3E	Technische Universitaet Dresden Dresden Germany /1998	Academic	64	**28.31** 38.4	29952 4032
392	IBM SP PC604 332 MHz	AI Informatics GmbH (AII) Austria /1999	Industry Database	88	**28.27** 58.42	. .
393	IBM SP PC604 332 MHz	DaimlerChrysler USA /1999	Industry Automotive	88	**28.27** 58.42	. .
394	IBM SP PC604 332 MHz	Government USA /1998	Classified	88	**28.27** 58.42	. .
395	IBM SP PC604 332 MHz	Montgomery Ward USA /1998	Industry Database	88	**28.27** 58.42	. .
396	IBM SP PC604 332 MHz	Origin IT UK /1998	Industry	88	**28.27** 58.42	. .
397	Compaq AlphaServer 8400 Cluster	Sandia National Labs Albuquerque USA /1997	Research	60	**28.145** 73.5	. .
398	IBM SP P2SC 120 MHz	o.tel.o Essen Germany /1998	Industry Telecomm	80	**27.77** 38.4	. .
399	SGI ORIGIN 2000 250 MHz - Eth-Cluster	Government USA /1998	Classified	96	**27.74** 48	. .
400	Fujitsu VPP300/13	Australian National University Canberra Australia /1996	Academic	13	**27.72** 28.6	. .

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
401	Hewlett-Packard Exemplar X-Class	Caltech/JPL Pasadena USA /1997	Research	64	**27.56** 46.08	29956 4584
402	Hewlett-Packard Exemplar X-Class	Caltech/JPL Pasadena USA /1997	Research	64	**27.56** 46.08	29956 4584
403	Hewlett-Packard Exemplar X-Class	HTC Babelsberg Germany /1997	Industry Image Proc.	64	**27.56** 46.08	29956 4584
404	Hewlett-Packard Exemplar X-Class	NCSA Urbana-Champaign USA /1997	Academic	64	**27.56** 46.08	29956 4584
405	Hewlett-Packard Exemplar X-Class	Naval Research Laboratory (NRL) Washington D.C. USA /1997	Classified	64	**27.56** 46.08	29956 4584
406	Hewlett-Packard Exemplar X-Class	Samsung Korea /1998	Industry Electronics	64	**27.56** 46.08	29956 4584
407	Hewlett-Packard Exemplar X-Class	University of Kentucky Lexington USA /1998	Academic	64	**27.56** 46.08	29956 4584
408	Sun HPC 10000 400 MHz	Bank USA /1999	Industry Finance	40	**27.56** 32	39936 2496
409	Sun HPC 10000 400 MHz	Lexis Nexis Miamisburg USA /1999	Industry Infor. Service	40	**27.56** 32	39936 2496
410	Sun HPC 10000 400 MHz	Lexis Nexis Miamisburg USA /1999	Industry Infor. Service	40	**27.56** 32	39936 2496
411	SGI T3E900	NOAA/Geophysical Fluid Dynamics Laboratory (GFDL) Princeton USA /1997	Research Weather	42	**27.31** 38.54	. .
412	SGI T3E900	Universitaet Rostock Germany /1997	Academic	42	**27.31** 38.54	. .
413	SGI ORIGIN 2000 250 MHz - Eth-Cluster	Government USA /1998	Classified	112	**27.19** 56	. .
414	NEC SX-4/14A	ONERA France /1998	Research Aerospace	14	**27.18** 28	. .
415	IBM SP PC604 332 MHz	Government France /1999	Classified	84	**27.03** 55.77	. .
416	IBM SP PC604 332 MHz	Responsor Sweden /1999	Industry	84	**27.03** 55.77	. .
417	IBM SP PC604 332 MHz	Sprint USA /1998	Industry Telecomm	84	**27.03** 55.77	. .
418	IBM SP PC604 332 MHz	UBS AG Switzerland /1999	Industry Finance	84	**27.03** 55.77	. .
419	SGI ORIGIN 2000	Oxford University Oxford UK /1998	Academic	84	**26.843** 32.76	. .
420	Sun HPC 10000	ATT USA /1997	Industry Telecomm	64	**26.45** 32	19968 3072

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
421	Sun HPC 10000	ATT USA /1997	Industry Telecomm	64 32	**26.45** 32	19968 3072
422	Sun HPC 10000	ATT USA /1997	Industry Telecomm	64 32	**26.45** 32	19968 3072
423	Sun HPC 10000	Chalmers University of Technology Goteborg Sweden /1997	Academic	64 32	**26.45** 32	19968 3072
424	Sun HPC 10000	GTE Communications USA /1997	Industry Telecomm	64 32	**26.45** 32	19968 3072
425	Sun HPC 10000	Kawasaki Heavy Industrie Japan /1998	Industry Manufacturing	64 32	**26.45** 32	19968 3072
426	Sun HPC 10000	Motorola USA /1997	Industry Electronics	64 32	**26.45** 32	19968 3072
427	Sun HPC 10000	Texas Instruments USA /1998	Industry Electronics	64 32	**26.45** 32	19968 3072
428	Sun HPC 10000	Tokyo Mitsubishi Bank London UK /1997	Industry Finance	64 32	**26.45** 32	19968 3072
429	Sun HPC 10000	University of Tokyo Tokyo Japan /1997	Academic	64 32	**26.45** 32	19968 3072
430	Sun HPC 10000	Virginia Social USA /1997	Research Database	64 32	**26.45** 32	19968 3072
431	IBM SP PC604 332 MHz	Bayer AG Germany /1998	Industry Chemistry	82	**26.41** 54.44	. .
432	Sun HPC 10000 333 MHz	Financial Corporation (A) New York USA /1998	Industry Finance	48	**26.38** 31.96	20352 2880
433	Sun HPC 10000 333 MHz	France Telecom Brie sur Marne France /1998	Industry Telecomm	48	**26.38** 31.96	20352 2880
434	Sun HPC 10000 333 MHz	GTE Communications Temple Terrace USA /1998	Industry Telecomm	48	**26.38** 31.96	20352 2880
435	Sun HPC 10000 333 MHz	Internal Revenue Service (IRS) - ITCC Lanham USA /1999	Government	48	**26.38** 31.96	20352 2880
436	Sun HPC 10000 333 MHz	Telcel Mexico City Mexico /1998	Industry Telecomm	48	**26.38** 31.96	20352 2880
437	Sun HPC 10000 333 MHz	University of Minnesota Minneapolis USA /1998	Academic	48	**26.38** 31.96	20352 2880
438	IBM SP P2SC 120 MHz	Swisscom Switzerland /1999	Industry Telecomm	76	**26.3** 36.48	. .
439	SGI ORIGIN 2000 250 MHz	BMW AG Muenchen Germany /1998	Industry Automotive	64 32	**26.24** 32	43520 5200
440	SGI ORIGIN 2000 250 MHz	Bristol-Myers Squibb USA /1999	Industry Pharmaceutics	64 32	**26.24** 32	43520 5200

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TOP500 **Supercomputers - Worldwide**

N $_{world}$	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
441	SGI ORIGIN 2000 250 MHz	C4 / Centre Europeo del Parallelismo de Barcelona Barcelona Spain /1998	Academic	64	**26.24** 32	43520 5200
442	SGI ORIGIN 2000 250 MHz	Cambridge University Cambridge UK /1999	Academic	64	**26.24** 32	43520 5200
443	SGI ORIGIN 2000 250 MHz	EDS/General Motors Auburn Hills USA /1999	Industry Automotive	64	**26.24** 32	43520 5200
444	SGI ORIGIN 2000 250 MHz	Earthquake Research Institute Japan /1999	Research	64	**26.24** 32	43520 5200
445	SGI ORIGIN 2000 250 MHz	Ford Motor Company USA /1998	Industry Automotive	64	**26.24** 32	43520 5200
446	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
447	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
448	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
449	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
450	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
451	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
452	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
453	SGI ORIGIN 2000 250 MHz	Government USA /1998	Classified	64	**26.24** 32	43520 5200
454	SGI ORIGIN 2000 250 MHz	Government USA /1998	Industry Defense	64	**26.24** 32	43520 5200
455	SGI ORIGIN 2000 250 MHz	Hospital For Sick Children Canada /1999	Research	64	**26.24** 32	43520 5200
456	SGI ORIGIN 2000 250 MHz	Janssen Parmaceutical Centre for Molecular Design Belgium /1999	Industry Pharmaceutics	64	**26.24** 32	43520 5200
457	SGI ORIGIN 2000 250 MHz	Lockheed-Marrietta USA /1999	Industry	64	**26.24** 32	43520 5200
458	SGI ORIGIN 2000 250 MHz	NASA/Ames Research Center/NAS Mountain View USA /1998	Research Aerospace	64	**26.24** 32	43520 5200
459	SGI ORIGIN 2000 250 MHz	NASA/Ames Research Center/NAS Mountain View USA /1998	Research Aerospace	64	**26.24** 32	43520 5200
460	SGI ORIGIN 2000 250 MHz	NASA/Ames Research Center/NAS/DAO Mountain View USA /1998	Research	64	**26.24** 32	43520 5200

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
461	SGI ORIGIN 2000 250 MHz	NASA/Ames Research Center/NAS/DAO Mountain View USA /1998	Research	64	**26.24** 32	43520 5200
462	SGI ORIGIN 2000 250 MHz	NASA/Goddard Space Flight Center Greenbelt USA /1998	Research Aerospace	64	**26.24** 32	43520 5200
463	SGI ORIGIN 2000 250 MHz	Raytheon Garland USA /1998	Industry Electronics	64	**26.24** 32	43520 5200
464	SGI ORIGIN 2000 250 MHz	Raytheon Garland USA /1998	Industry Electronics	64	**26.24** 32	43520 5200
465	SGI ORIGIN 2000 250 MHz	Raytheon Garland USA /1998	Industry Electronics	64	**26.24** 32	43520 5200
466	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
467	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
468	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
469	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
470	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
471	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
472	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
473	SGI ORIGIN 2000 250 MHz	Raytheon-GARLAND USA /1998	Industry	64	**26.24** 32	43520 5200
474	SGI ORIGIN 2000 250 MHz	University of Buffalo USA /1998	Academic	64	**26.24** 32	43520 5200
475	SGI ORIGIN 2000 250 MHz	University of Technology Austria /1998	Academic	64	**26.24** 32	43520 5200
476	SGI ORIGIN 2000 250 MHz	Western Geophysical London UK /1998	Industry Geophysics	64	**26.24** 32	43520 5200
477	Sun HPC 10000 400 MHz	Motorola Schaumburg USA /1999	Industry Electronics	38	**26.16** 30.4	. .
478	Sun HPC 10000 400 MHz	Motorola Schaumburg USA /1999	Industry Electronics	38	**26.16** 30.4	. .
479	IBM SP PC604 332 MHz	American Express USA /1998	Industry Finance	80	**25.79** 53.11	. .
480	IBM SP PC604 332 MHz	Deluxe Check USA /1999	Industry Finance	80	**25.79** 53.11	. .

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Gflop/s]	N_{max} $N_{1/2}$
481	IBM SP PC604 332 MHz	Finance Corp. (A) Japan /1998	Industry Finance	80	**25.79** 53.11	. .
482	IBM SP PC604 332 MHz	ISSC Italy /1999	Industry	80	**25.79** 53.11	. .
483	Fujitsu VPP300/12	Japan Atomic Energy Research Japan /1996	Research	12	**25.6** 26.4	. .
484	Sun HPC 10000 400 MHz	Aetna Life Insurance Middletown USA /1999	Industry Database	37	**25.46** 29.6	. .
485	IBM SP2 77 MHz wide	Pacific Northwest National Laboratory Richland USA /1997	Research	128	**25.42** 39.42	. .
486	Sun HPC 10000 333 MHz	American Express Belgium /1998	Industry	46	**25.37** 30.63	. .
487	SGI T3D MC256-8/464	Bear Stearns USA /1996	Industry Finance	256	**25.3** 38	40960 4918
488	SGI T3D SC256-8/264	Caltech/JPL Pasadena USA /1994	Research	256	**25.3** 38	40960 4918
489	SGI T3D MC256-8	Defense Research Agency (DRA) Farnborough UK /1994	Classified	256	**25.3** 38	40960 4918
490	SGI T3D MC256-8	EXXON USA /1995	Industry Geophysics	256	**25.3** 38	40960 4918
491	SGI T3D MC256-8	Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1994	Academic	256	**25.3** 38	40960 4918
492	SGI ORIGIN 2000 - Eth-Cluster	Government USA /1998	Classified	96	**25.28** 37.44	. .
493	IBM SP PC604 332 MHz	ATAC France /1998	Industry	78	**25.17** 51.78	. .
494	Compaq AlphaServer 8400 Cluster	Lawrence Livermore National Laboratory Livermore USA /1997	Research	54	**24.78** 66.15	. .
495	Sun HPC 10000 400 MHz	AIM Management Houston USA /1999	Industry Finance	36	**24.77** 28.8	39936 2304
496	Sun HPC 10000 400 MHz	Allstate Insurance Northbrook USA /1998	Industry Database	36	**24.77** 28.8	39936 2304
497	Sun HPC 10000 400 MHz	US Navy San Diego USA /1999	Classified	36	**24.77** 28.8	39936 2304
498	Sun HPC 10000 400 MHz	US Navy San Diego USA /1999	Classified	36	**24.77** 28.8	39936 2304
499	Sun HPC 10000 400 MHz	University of North Carolina Chapel Hill USA /1999	Academic	36	**24.77** 28.8	39936 2304
500	SGI T3E900	CIEMAT Spain /1998	Research	38	**24.73** 35.07	. .

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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://www.top500.org 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	127	42	11	2	182
IBM	67	48	2	1	118
Sun	65	20	6	4	95
Hewlett-Packard	29	9		1	39
Fujitsu	1	6	15	1	23
NEC	1	6	10	1	18
Hitachi		1	11		12
others	10	2	1		13
Total	300	134	56	10	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	13012.0	4926.9	485.3	191.5	18615.7
IBM	5216.6	2080.8	175.2	40.3	7512.8
Sun	2144.1	643.4	189.6	148.2	3125.3
Hewlett-Packard	935.4	280.3		27.6	1243.2
Fujitsu	45.9	545.3	1204.7	27.7	1823.7
NEC	244.0	240.3	807.7	61.8	1353.7
Hitachi		58.7	2557.1		2615.8
others	2654.1	60.0	103.5		2817.6
Total	24252.1	8835.7	5523.1	497.0	39107.8

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

TOP500 Statistics — Installed R_{peak} [Gflop/s]					
	USA/Canada	Europe	Japan	others	Total
SGI	18895	6885.8	625.6	277.2	26683
IBM	9563.8	3756.3	258.1	57.0	13635
Sun	2628.1	787.1	234.4	177.0	3826.6
Hewlett-Packard	1745.5	496.5		46.1	2288.0
Fujitsu	48.4	620.8	1370.6	28.6	2068.4
NEC	256.0	248.0	842.0	64.0	1410.0
Hitachi		77.0	3200.0		3277.0
others	4244.8	137.6	125.1		4507.5
Total	37381	13009	6655.7	649.8	57696

Mannheim/Tennessee June 10, 1999

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