TOP500 Supercomputer Sites

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

Computing Center
University of Mannheim
D-68131 Mannheim
Germany

strohmaier@rz.uni-mannheim.de

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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.

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

In the present list (which we call the TOP500), we list computer 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 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*.

2 The LINPACK Benchmark

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

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

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

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

3 The TOP500 List

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

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

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

If there should be any changes in the performances given in Table 1 we will update them. This especially applies to early performance data like Convex's SPP1000 values in this issue.

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 alphabeticly.

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
1	Fujitsu Numerical Wind Tunnel	NAL Japan /1993	Research Aerospace	140	**170400** 236000	42000 13800
2	Intel XP/S140	Sandia National Labs Albuquerque USA /1993	Research	3680	**143400** 184000	55700 20500
3	TMC CM-5/1056	Los Alamos National Laboratory Los Alamos USA /1993	Research Energy	1056	**59700** 135100	52224 24064
4	TMC CM-5/864	Minnesota Supercomputer Center USA /1994	Academic	864	**50500** 110600	47000 22100
5	Fujitsu VPP500/30	The Angstrom Technology Partnership Tsukuba Japan /1993	Research	30	**39812** 48000	. .
6	Fujitsu VPP500/30	Tsukuba University Tsukuba Japan /1993	Research	30	**39812** 48000	. .
7	Fujitsu VPP500/28	Institute of Physical and Chemical Res. (RIKEN) Tokyo Japan /1993	Research	28	**37225** 44800	. .
8	TMC CM-5/512	NCSA Urbana-Champaign USA /1993	Academic	512	**30400** 66000	36864 16384
9	TMC CM-5/512	National Security Agency USA /1993	Classified	512	**30400** 66000	36864 16384
10	Hitachi S-3800/480	Hitachi Ltd. GPCD Japan /1994	Vendor	4	**27500** 32000	15020 870
11	Hitachi S-3800/480	University of Tokyo Tokyo Japan /1993	Academic	4	**27500** 32000	15020 870
12	Cray T3D MC256-8	Cray Research Eagan USA /1994	Vendor	256	**25300** 38000	40960 4918
13	Cray T3D MC256-8	Pittsburgh Supercomputing Center Pittsburgh USA /1994	Academic	256	**25300** 38000	40960 4918
14	Cray T3D MC256-8	University of Edinburgh Edinburgh UK /1994	Academic	256	**25300** 38000	40960 4918
15	NEC SX-3/44R	Atmospheric Environment Service (AES) Dorval Canada /1994	Research Weather	4	**23200** 26000	6400 830
16	NEC SX-3/44R	NEC Fuchu Plant Japan /1990	Vendor	4	**23200** 26000	6400 830
17	NEC SX-3/44R	Tohoku University Tohoku Japan /1993	Academic	4	**23200** 26000	6400 830
18	Hitachi S-3800/380	University of Tohoku Japan /1994	Academic	3	**21300** 24000	15020 690
19	NEC SX-3/44	Atmospheric Environment Service (AES) Dorval Canada /1991	Research Weather	4	**20000** 22000	6144 832
20	NEC SX-3/34R	National Inst. for Molecular Science Okozaki Japan /1993	Research	3	**17400** 19500	6144 691

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
21	Intel XP/S35	CSCC TRex USA /1994	Research	512	**15200** 25600	23000 9000
22	Intel XP/S35	Oak Ridge National Laboratory Oak Ridge USA /1992	Research	512	**15200** 25600	23000 9000
23	TMC CM-5/256	Goverment USA /1993	Classified	256	**15100** 33000	26112 12032
24	TMC CM-5/256	Thinking Machines USA /1993	Vendor	256	**15100** 33000	26112 12032
25	TMC CM-5/256	US Naval Research Laboratory Washington D.C. USA /1992	Research	256	**15100** 33000	26112 12032
26	Intel Delta	Caltech Pasadena USA /1991	Academic	512	**13900** 20480	25000 7500
27	Cray Y-MP C916/16256	Cray Research Eagan USA /1992	Vendor	16	**13700** 15238	10000 650
28	Cray Y-MP C916/16512	DOD/CEWES Vicksburg USA /1993	Research Mechanics	16	**13700** 15238	10000 650
29	Cray Y-MP C916/16256	DOE/Bettis Atomic Power Laboratory USA /1993	Research	16	**13700** 15238	10000 650
30	Cray Y-MP C916/16256	DOE/Knolls Atomic Power Laboratory USA /1993	Research	16	**13700** 15238	10000 650
31	Cray Y-MP C916/16256	ECMWF Reading UK /1994	Research Weather	16	**13700** 15238	10000 650
32	Cray Y-MP C916/16512	Ford Motor Company Dearborn USA /1993	Industry Automotive	16	**13700** 15238	10000 650
33	Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
34	Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
35	Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
36	Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
37	Cray Y-MP C916/16256	Government Communications Headquarters Benhall UK /1994	Classified	16	**13700** 15238	10000 650
38	Cray Y-MP C916/16512	KIST/System Engineering Research Institute Korea /1993	Academic	16	**13700** 15238	10000 650
39	Cray Y-MP C916/16256	Lawrence Livermore National Laboratory Livermore USA /1992	Research Energy	16	**13700** 15238	10000 650
40	Cray Y-MP C916/161024	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	16	**13700** 15238	10000 650

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
41	Cray Y-MP C916/16512	Pittsburgh Supercomputing Center Pittsburgh USA /1994	Academic	16	**13700** 15238	10000 650
42	Cray Y-MP C916/16256	Res. Inf. Processing System (RIPS) Tsukuba Japan /1994	Research	16	**13700** 15238	10000 650
43	Cray Y-MP C916/16256	US Naval Oceanographic Command Bay Saint Louis USA /1993	Research Weather	16	**13700** 15238	10000 650
44	Cray Y-MP C916/16256	United Kingdom Meteorological Office Bracknell UK /1994	Research Weather	16	**13700** 15238	10000 650
45	Fujitsu VPP500/10	Communications Res. Lab. (CRL) Tokyo Japan /1993	Research	10	**13675** 16000	. .
46	Cray T3D MC128-2	CEA/Centre d'Etudes Limeil-Valenton France /1993	Research	128	**12800** 19000	20736 3408
47	Cray T3D SC128-2/264	Caltech/JPL Pasadena USA /1994	Academic	128	**12800** 19000	20736 3408
48	Cray T3D MC128-2	Commissariat a l'Energie Atomique Grenoble France /1994	Research Energy	128	**12800** 19000	20736 3408
49	Cray T3D MC128-2	ECMWF Reading UK /1994	Research Weather	128	**12800** 19000	20736 3408
50	Cray T3D MC128-2	Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1994	Academic	128	**12800** 19000	20736 3408
51	Cray T3D MC128-2	Minnesota Supercomputer Center USA /1994	Academic	128	**12800** 19000	20736 3408
52	Cray T3D MC128-2	Reactor Nuclear Fuel Development Japan /1994	Research	128	**12800** 19000	20736 3408
53	Cray T3D MC128-2	University of Alaska Fairbanks USA /1994	Academic	128	**12800** 19000	20736 3408
54	IBM SP2/512	Cornell University USA /1994	Academic	512	**12100** 136000	27000 6200
55	IBM SP2/400	Maui High-Performance Computing Center (MHPCC) USA /1994	Research	400	**12100** 106000	27000 6200
56	IBM SP2/160	NASA/Ames Research Center/NAS Moffett Field USA /1994	Research	160	**12100** 42500	27000 6200
57	IBM SP2/128	IBM/Watson Research Center Yorktown USA /1994	Vendor	128	**12100** 34000	27000 6200
58	IBM SP2/64	CERN Geneva Switzerland /1994	Research	64	**12100** 17000	27000 6200
59	IBM SP2/64	Maui High-Performance Computing Center (MHPCC) USA /1994	Research	64	**12100** 17000	27000 6200
60	Intel XP/S30	UCSD/San Diego Supercomputer Center San Diego USA /1993	Academic	400	**11900** 20000	. .

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61	NEC SX-3/24R	German Aerospace Laboratory (DLR) Goettingen Germany /1994	Research Aerospace	2	**11600** 13000	4352 516
62	NEC SX-3/24R	NEC Fuchu Plant Japan /1994	Vendor	2	**11600** 13000	4352 516
63	NEC SX-3/24R	National Institute of Fusion Science (NIFS) Japan /1993	Research	2	**11600** 13000	4352 516
64	NEC SX-3/24R	Swiss Scientific Computing Center Manno Switzerland /1994	Research	2	**11600** 13000	4352 516
65	Cray Y-MP C916/12256	DKRZ Hamburg Germany /1994	Research Weather	12	**10270** 11430	. .
66	Intel XP/S25	NAL Japan /1994	Research	336	**10000** 16800	. .
67	Intel XP/S25	NRAD USA /1994	Research	336	**10000** 16800	. .
68	TMC CM-200/64k	Los Alamos National Laboratory Los Alamos USA / .	Research Energy	2048	**9800** 20000	29696 11264
69	TMC CM-200/64k	Los Alamos National Laboratory Los Alamos USA / .	Research Energy	2048	**9800** 20000	29696 11264
70	Fujitsu VPP500/7	Institute of Space Astronautical Science (ISAS) Tokyo Japan /1993	Research	7	**9650** 11200	. .
71	TMC CM-5/160	Schlumberger Well Services Houston USA /1992	Industry Geophysics	160	**9500** 20500	. .
72	IBM SP2/48	NASA/Langley Research Center Hampton USA /1994	Research	48	**9100** 12770	. .
73	IBM SP2/48	PIK Potsdam Germany /1994	Research	48	**9100** 12770	. .
74	TMC CM-5E/128	The Angstrom Technology Partnership Tsukuba Japan /1994	Research	128	**7700** 20000	18432 8192
75	TMC CM-5/128	AMEX USA /1993	Industry	128	**7700** 16000	18432 8192
76	TMC CM-5/128	GECO-PRAKLA Houston USA /1994	Industry Geophysics	128	**7700** 16000	18432 8192
77	TMC CM-5/128	Goverment USA /1993	Classified	128	**7700** 16000	18432 8192
78	TMC CM-5/128	Institut de Physique du Globe de Paris (IPG) Paris France /1992	Research	128	**7700** 16000	18432 8192
79	TMC CM-5/128	MIT Cambridge USA / .	Research	128	**7700** 16000	18432 8192
80	TMC CM-5/128	Mobil / Technical Center Tulsa USA /1992	Industry Geophysics	128	**7700** 16000	18432 8192

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81	TMC CM-5/128	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	128	**7700** 16000	18432 8192
82	Intel XP/S20	Wright Patterson AFB USA /1994	Research	256	**7600** 12800	16000 4000
83	Hitachi S-3800/180	Central Res. Inst. of Electric Power Ind. Japan /1994	Research	1	**7400** 8000	15020 390
84	Hitachi S-3800/180	Hitachi LTD. Energy Res. Lab. Japan /1993	Vendor	1	**7400** 8000	15020 390
85	Hitachi S-3800/180	Meteorological Research Institute Japan /1993	Research Weather	1	**7400** 8000	15020 390
86	Hitachi S-3800/260	Suzuki Motor Japan /1993	Industry Automotive	2	**7100** 8000	. .
87	KSR KSR2-128	KSR Boston USA /1994	Vendor	128	**6923** 10240	9280 4128
88	Cray Y-MP C98/8512	CNRS Orsay France /1993	Research	8	**6850** 7619	. .
89	Cray Y-MP C98/8512	Cray Research Eagan USA / .	Vendor	8	**6850** 7619	. .
90	Cray Y-MP C916/8512	Ford Motor Company Dearborn USA /1994	Industry Automotive	8	**6850** 7619	. .
91	Cray Y-MP C916/8512	Minnesota Supercomputer Center USA /1994	Academic	8	**6850** 7619	. .
92	Cray Y-MP C916/8256	NASA/Ames Research Center/CCF Moffett Field USA /1993	Research Aerospace	8	**6850** 7619	. .
93	Cray Y-MP C98/8128	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	8	**6850** 7619	. .
94	Cray Y-MP C98/8128	UCSD/San Diego Supercomputer Center San Diego USA /1993	Academic	8	**6850** 7619	. .
95	Cray Y-MP C916/8128	US Navy/Fleet Numerical Oceanography Center Monterey USA /1992	Research Weather	8	**6850** 7619	. .
96	Cray T3D MC64-2	Cray Research Eagan USA /1994	Vendor	64	**6400** 9600	20736 2368
97	Cray T3D MC64-2	Mitsubishi Electric Corporation Kanagawa Japan /1994	Industry Electronics	64	**6400** 9600	20736 2368
98	KSR KSR2-110	Leibniz Rechenzentrum Muenchen Germany /1994	Academic	110	**6380** 8800	. .
99	Intel XP/S15	NASA/Ames Research Center/NAS Moffett Field USA /1992	Research	208	**6200** 10400	. .
100	Intel XP/S15	NOAA USA /1994	Research	208	**6200** 10400	. .

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101	IBM SP2/32	National Cancer Research Institute Tokyo Japan /1994	Research	32	**6100** 8500	19000 4088
102	NEC SX-3/41R	Japan Atomic Energy Research Japan /1992	Research	4	**5800** 6400	3584 414
103	NEC SX-3/14R	Osaka University Osaka Japan /1993	Academic	1	**5800** 6400	2816 282
104	NEC SX-3/14R	Toyota Central Research Development Japan /1992	Industry Automotive	1	**5800** 6400	2816 282
105	TMC CM-5/96	University of California at Berkeley USA / .	Academic	96	**5700** 13370	. .
106	SNI VPP500/4	Universitaet Aachen Aachen Germany /1993	Academic	4	**5600** 6400	7344 1250
107	SNI VPP500/4	Universitaet Darmstadt Darmstadt Germany /1994	Academic	4	**5600** 6400	7344 1250
108	TMC CM-2/64k	Brandeis University USA / .	Academic	2048	**5200** 14000	26624 11000
109	TMC CM-2/64k	Florida State University Tallahassee USA / .	Academic	2048	**5200** 14000	26624 11000
110	TMC CM-2/64k	SRC USA /1993	Industry	2048	**5200** 14000	26624 11000
111	Meiko CS-2/128	Lawrence Livermore National Laboratory Livermore USA /1994	Research Energy	128	**5000** 23000	18688 6144
112	TMC CM-200/32k	Minnesota Supercomputer Center USA / .	Academic	1024	**5000** 10000	21504 8192
113	TMC CM-200/32k	Western Geophysical Houston USA /1994	Industry Geophysics	1024	**5000** 10000	21504 8192
114	NEC SX-3/14	IBM Japan Ltd. Tokyo Japan /1991	Industry Electronics	1	**5000** 5500	3072 384
115	NEC SX-3/22	NEC Systems Laboratories Inc. Houston USA /1991	Research	2	**5000** 5500	3072 384
116	NEC SX-3/22	National Aerospace Laboratory (NLR) Noordoostpolder Netherlands /1992	Research Aerospace	2	**5000** 5500	3072 384
117	NEC SX-3/14	National Institute of Environmental Studies Japan /1992	Research Environment	1	**5000** 5500	3072 384
118	IBM 9076-005 SP1	Argonne Nat. Lab USA /1993	Academic	128	**4800** 16000	26000 6000
119	IBM 9076-004 SP1	Cornell University USA /1993	Academic	64	**4800** 8000	26000 6000
120	KSR KSR2-80	Pacific Northwest Laboratories/Batelle Richland USA /1994	Research	80	**4770** 6400	. .

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121	Cray Y-MP C98/6256	Electricite de France Clamart France /1994	Industry Energy	6	**4630** 5715	. .
122	Cray Y-MP C98/6256	NASA/Goddard Space Flight Center Greenbelt USA /1993	Research Weather	6	**4630** 5715	. .
123	IBM SP2/22	Queensland University of Technology Nathan Australia /1994	Academic	22	**4190** 5850	. .
124	Intel XP/S10	Grand Tensor Houston USA /1994	Industry Geophysics	140	**4100** 7000	. .
125	Intel XP/S10	Hong Kong University of Science and Technology Hong Kong Hong Kong /1994	Academic	140	**4100** 7000	. .
126	Intel XP/S10	Intel SSD Development Centers USA /1992	Vendor	140	**4100** 7000	. .
127	Intel XP/S10	KFA Juelich Germany /1994	Research	140	**4100** 7000	. .
128	Intel XP/S10	National Security Agency USA /1994	Classified	140	**4100** 7000	. .
129	Intel XP/S10	Purdue University USA /1994	Academic	140	**4100** 7000	. .
130	Fujitsu VP2600/10	Fuji Heavy Japan /1990	Industry Heavy Ind.	1	**4009** 5000	. .
131	Fujitsu VP2600/10	Japan Atomic Energy Research Japan /1991	Research	1	**4009** 5000	. .
132	Fujitsu VP2600/10	Japan Atomic Energy Research Japan /1991	Research	1	**4009** 5000	. .
133	Fujitsu VP2600/20	Kyoto University Kyoto Japan /1990	Academic	1	**4009** 5000	. .
134	Fujitsu VP2600/10	Kyushu University Kyushu Japan /1992	Academic	1	**4009** 5000	. .
135	Fujitsu VP2600/10	NAL (Space Technology) Japan /1990	Research	1	**4009** 5000	. .
136	Fujitsu VP2600/10	Nagoya University Nagoya Japan /1991	Academic	1	**4009** 5000	. .
137	Fujitsu VP2600/10	Reactor Nuclear Fuel Development Japan /1991	Research	1	**4009** 5000	. .
138	Fujitsu VP2600/10	Reactor Nuclear Fuel Development Japan /1991	Research	1	**4009** 5000	. .
139	Fujitsu VP2600/10	Taisei Construction Japan /1992	Industry Construction	1	**4009** 5000	. .
140	SNI S600/20	Universitaet Aachen Aachen Germany /1991	Academic	1	**4009** 5000	. .

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141	SNI S600/20	Universitaet Karlsruhe Karlsruhe Germany /1990	Academic	1	**4009** 5000	. .
142	KSR KSR2-64	Georgia Institute of Technology USA /1994	Research	64	**3911** 5120	9216 3840
143	KSR KSR2-64	University of Michigan Michigan USA /1994	Academic	64	**3911** 5120	9216 3840
144	KSR KSR2-64	University of Washington Seattle USA /1994	Academic	64	**3911** 5120	9216 3840
145	TMC CM-5/64	AMOCO Tulsa USA / .	Industry Geophysics	64	**3800** 8192	13056 6016
146	TMC CM-5/64	ATR Kyoto Japan / .		64	**3800** 8192	13056 6016
147	TMC CM-5/64	Boston University Boston USA / .	Academic	64	**3800** 8192	13056 6016
148	TMC CM-5/64	EPS USA /1993	Industry	64	**3800** 8192	13056 6016
149	TMC CM-5/64	GMD Birlinghoven Germany /1993	Research	64	**3800** 8192	13056 6016
150	TMC CM-5/64	Japanese AIST Hokuriku Japan /1993		64	**3800** 8192	13056 6016
151	TMC CM-5/64	Oregon State University USA / .	Academic	64	**3800** 8192	13056 6016
152	TMC CM-5/64	Real World Computing (RWCP) Tokyo Japan /1992	Classified	64	**3800** 8192	13056 6016
153	TMC CM-5/64	University of Wisconsin USA / .	Academic	64	**3800** 8192	13056 6016
154	SGI Power Challenge	NASA/Ames Research Center/NAS Mountain View USA /1994	Research Aerospace	18	**3715** 5400	14000 2000
155	SGI Power Challenge	Silicon Graphics Mountain View USA /1994	Vendor	18	**3715** 5400	14000 2000
156	SGI Power Challenge	Silicon Graphics Mountain View USA /1994	Vendor	18	**3715** 5400	14000 2000
157	SGI Power Challenge	Universidad Autonoma Metropolitana Istapalapa Mexico / .	Academic	18	**3715** 5400	14000 2000
158	SNI S400/40	Universitaet Darmstadt Darmstadt Germany /1991	Academic	2	**3624** 5000	10239 .
159	SNI S400/40	Universitaet Hannover Hannover Germany /1991	Academic	2	**3624** 5000	10239 .
160	SGI Power Challenge	EMBL Heidelberg Germany /1994	Research	16	**3624** 4800	14000 2000

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
161	SGI Power Challenge	NCSA Urbana-Champaign USA /1994	Research	16	**3624** 4800	14000 2000
162	SGI Power Challenge	Silicon Graphics Mountain View USA /1994	Vendor	16	**3624** 4800	14000 2000
163	SGI Power Challenge	Silicon Graphics Mountain View USA /1994	Vendor	16	**3624** 4800	14000 2000
164	SGI Power Challenge	Texas AM University College Station USA /1994	Academic	16	**3624** 4800	14000 2000
165	Intel XP/S8	ETH Zuerich Switzerland /1994	Academic	110	**3430** 5500	. .
166	Intel XP/S8	National Security Agency USA /1994	Classified	110	**3430** 5500	. .
167	Intel XP/S8	University of Bergen Bergen Norway /1994	Academic	110	**3430** 5500	. .
168	KSR KSR1-256	US Army Research Laboratory Aberdeen USA /1993	Research	256	**3380** 10240	10240 1824
169	KSR KSR1-128	Cornell Theory Center Ithaca USA /1992	Academic	128	**3380** 5120	10240 1824
170	KSR KSR1-128	University of Cincinati USA /1993	Academic	128	**3380** 5120	10240 1824
171	SGI Power Challenge	BMW AG Muenchen Germany /1994	Industry Automotive	14	**3297** 4200	14000 2000
172	SGI Power Challenge	FU Berlin Berlin Germany /1994	Academic	14	**3297** 4200	14000 2000
173	SGI Power Challenge	Technical University Eindhoven Netherlands /1994	Academic	14	**3297** 4200	14000 2000
174	SGI Power Challenge	University of Athens Athen Greece /1994	Academic	14	**3297** 4200	14000 2000
175	Cray Y-MP C98/4256	Direction de la Meteorologie Nationale Toulouse France /1993	Research Weather	4	**3275** 3810	. .
176	Cray Y-MP C94A/4128	Instituto National de Meteorologia (INM) Spain /1993	Research Weather	4	**3275** 3810	. .
177	Cray Y-MP C98/4256	SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1994	Academic	4	**3275** 3810	. .
178	Cray Y-MP C94/41024	Universitaet Stuttgart Stuttgart Germany /1994	Research	4	**3275** 3810	. .
179	Cray Y-MP C94/4256	debis Stuttgart Germany /1994	Industry Automotive	4	**3275** 3810	. .
180	Cray T3D MC32-2	Chrysler Motors Company USA /1994	Industry Automotive	32	**3200** 4800	14592 1616

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TOP500 **Supercomputers - Worldwide**

N $_{world}$	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
181	Cray T3D MC32-2	DKRZ Hamburg Germany /1994	Research Weather	32	**3200** 4800	14592 1616
182	Cray T3D MC32-8	Ohio Supercomputer Center Columbus USA /1994	Academic	32	**3200** 4800	14592 1616
183	Cray T3D MC32-2	Universitaet Stuttgart Stuttgart Germany /1994	Research	32	**3200** 4800	14592 1616
184	IBM SP2/16	Catholic University of Leuven Belgium /1994	Academic	16	**3000** 4300	13500 .
185	IBM SP2/16	Maui High-Performance Computing Center (MHPCC) USA /1994	Research	16	**3000** 4300	13500 .
186	NEC SX-3/12R	Institute of Space Science (INPE) Brazil /1994	Research Weather	1	**2900** 3200	2048 174
187	NEC SX-3/12R	NEC Scientific Information Systems Dev. (NSIS) Japan /1992	Research	1	**2900** 3200	2048 174
188	NEC SX-3/21R	Obayashi Corporation Japan /1992	Industry	2	**2900** 3200	2560 257
189	Cray Computer CRAY-3/4-512	Cray Computer Corporation Colorado Springs USA /1994	Vendor	4	**2862** 3792	. .
190	SGI Power Challenge	Jackson State University Jackson USA /1994	Academic	12	**2816** 3600	14000 2000
191	SGI Power Challenge	Silicon Graphics Mountain View USA /1994	Vendor	12	**2816** 3600	14000 2000
192	Meiko CS-2/32	CERFACS Toulouse UK /1994	Research	32	**2800** 5800	13824 3488
193	Meiko CS-2/32	CERN Geneva Switzerland /1994	Research	32	**2800** 5800	13824 3488
194	IBM SP2/14	DKFZ Heidelberg Germany /1994	Research	14	**2650** 3720	. .
195	TMC CM-2/32k	AMK Bonn Germany /1990	Classified	1024	**2600** 7000	. .
196	TMC CM-2/32k	Columbia Law School USA /1994	Academic	1024	**2600** 7000	. .
197	Intel iPSC/860	Alliant Techsystems Inc. USA /1990	Industry Biochemistry	128	**2600** 5120	12000 4500
198	Intel iPSC/860	Grant Tensor Houston USA /1991	Industry Geophysics	128	**2600** 5120	12000 4500
199	Intel iPSC/860	Grant Tensor Houston USA /1992	Industry Geophysics	128	**2600** 5120	12000 4500
200	Intel iPSC/860	Grant Tensor London UK /1991	Industry Geophysics	128	**2600** 5120	12000 4500

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
201	Intel iPSC/860	Grant Tensor London UK /1994	Industry Geophysics	128	**2600** 5120	12000 4500
202	Intel iPSC/860	Honeywell USA /1990	Industry	128	**2600** 5120	12000 4500
203	Intel iPSC/860	Lockheed Advanced Development Palmdale USA /1992	Industry Aerospace	128	**2600** 5120	12000 4500
204	Intel iPSC/860	NASA/Ames Research Center/NAS Moffett Field USA /1990	Research	128	**2600** 5120	12000 4500
205	Intel iPSC/860	NIH Frederick USA /1990	Research	128	**2600** 5120	12000 4500
206	Intel iPSC/860	ONERA Chatillon France /1991	Research Aerospace	128	**2600** 5120	12000 4500
207	Intel iPSC/860	Oak Ridge National Laboratory Oak Ridge USA /1989	Research	128	**2600** 5120	12000 4500
208	KSR KSR1-96	ATR Japan /1993	Industry	96	**2535** 3840	. .
209	KSR KSR1-96	Florida State University Tallahassee USA /1993	Academic	96	**2535** 3840	. .
210	Convex C4/XA-4	Ford Dearborn USA /1994	Industry Automotive	4	**2531** 3240	. .
211	Cray Y-MP C94/3256	Commissariat a l'Energie Atomique Grenoble France /1994	Research Energy	3	**2489** 2857	. .
212	SGI Power Challenge	Missle Space Intelligence Center Huntsville USA /1994	Classified	10	**2450** 3000	14000 2000
213	SGI Power Challenge	Silicon Graphics Houston USA /1994	Vendor	10	**2450** 3000	14000 2000
214	SGI Power Challenge	Silicon Graphics Mountain View USA /1994	Vendor	10	**2450** 3000	14000 2000
215	SGI Power Challenge	Universitaet Kaiserslautern Kaiserslautern Germany /1994	Academic	10	**2450** 3000	14000 2000
216	SGI Power Challenge	University of Calgary Calgary Canada /1994	Academic	10	**2450** 3000	14000 2000
217	TMC CM-200/16k	INRIA - Sophia Antipolis Rennes France /1992	Research	512	**2400** 5000	14848 5632
218	TMC CM-200/16k	US Naval Research Laboratory Washington D.C. USA /1987	Research	512	**2400** 5000	14848 5632
219	TMC CM-200/16k	University of Edinburgh Edinburgh UK / .	Academic	512	**2400** 5000	14848 5632
220	IBM 9076-003 SP1	Penn State University USA /1993	Academic	32	**2400** 4000	16000 4000

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
221	Intel XP/S5	NAWC USA /1994	Research	72	**2200** 3600	. .
222	Intel XP/S5	Universitaet Stuttgart Stuttgart Germany /1992	Academic	72	**2200** 3600	. .
223	Cray CRAY-2s/8-128	Lawrence Livermore National Laboratory Livermore USA /1990	Research Energy	8	**2171** 3902	. .
224	Cray Y-MP8E/8256	Arabian American Oil Company Saudi Arabia/1991	Industry Geophysics	8	**2144** 2667	. .
225	Cray Y-MP8/864	Atomic Weapons Establishment USA /1990	Classified	8	**2144** 2667	. .
226	Cray Y-MP8/864	Atomic Weapons Establishment Aldermaston UK / .	Classified	8	**2144** 2667	. .
227	Cray Y-MP8/864	City Polytechnic of Hong Kong Hong Kong Hong Kong /1994	Academic	8	**2144** 2667	. .
228	Cray Y-MP8/8128	Commissariat a l'Energie Atomique Limeil France /1991	Research Energy	8	**2144** 2667	. .
229	Cray Y-MP8/8128	Cray Research Eagan USA / .	Vendor	8	**2144** 2667	. .
230	Cray Y-MP8/832	Cray Research Eagan USA / .	Vendor	8	**2144** 2667	. .
231	Cray Y-MP8/8128	DOD/CEWES Vicksburg USA /1993	Research Mechanics	8	**2144** 2667	. .
232	Cray Y-MP8/864	DOE/Bettis Atomic Power Laboratory USA /1990	Research	8	**2144** 2667	. .
233	Cray Y-MP8/864	DOE/Knolls Atomic Power Laboratory USA /1990	Research	8	**2144** 2667	. .
234	Cray Y-MP8/8256	DOE/National Security Agency USA / .	Classified	8	**2144** 2667	. .
235	Cray Y-MP8/864	KFA Juelich Germany /1993	Research	8	**2144** 2667	. .
236	Cray Y-MP8/8128	Lawrence Livermore National Laboratory Livermore USA /1991	Research	8	**2144** 2667	. .
237	Cray Y-MP8/864	Lawrence Livermore National Laboratory Livermore USA /1992	Research	8	**2144** 2667	. .
238	Cray Y-MP8/8128	Leibniz Rechenzentrum Muenchen Germany /1992	Academic	8	**2144** 2667	. .
239	Cray Y-MP8/8128	Los Alamos National Laboratory Los Alamos USA /1992	Research Energy	8	**2144** 2667	. .
240	Cray Y-MP8/864	Los Alamos National Laboratory Los Alamos USA /1992	Research Energy	8	**2144** 2667	. .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
241	Cray Y-MP8/8256	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	8	**2144** 2667	. .
242	Cray Y-MP8E/8256	NASA/Langley Research Center Hampton USA /1992	Research	8	**2144** 2667	. .
243	Cray Y-MP8/8128	NASA/Lewis Research Center Cleveland USA /1991	Research	8	**2144** 2667	. .
244	Cray Y-MP8/864	NOAA USA /1990	Research Weather	8	**2144** 2667	. .
245	Cray Y-MP8/832	NOAA/GFDL USA /1990	Research Weather	8	**2144** 2667	. .
246	Cray Y-MP8/8128	National Cancer Institute USA /1991	Research Chemistry	8	**2144** 2667	. .
247	Cray Y-MP8/864	National Center for Atmospheric Research Boulder USA /1990	Research Weather	8	**2144** 2667	. .
248	Cray Y-MP8E/8128	Navy POPS Supercomputing Facility Saint Louis USA / .	Research Weather	8	**2144** 2667	. .
249	Cray Y-MP8/864	Ohio Supercomputer Center Columbus USA /1989	Academic	8	**2144** 2667	. .
250	Cray Y-MP8I/8128	Rutherford Appleton Laboratory UK /1992	Research	8	**2144** 2667	. .
251	Cray Y-MP8/864	Sandia National Labs Albuquerque USA / .	Research	8	**2144** 2667	. .
252	Cray Y-MP8/8128	Tohoku University, Institute of Fluid Science Aramaki Japan /1992	Academic	8	**2144** 2667	. .
253	Cray Y-MP8/864	University of Texas Austin USA /1990	Academic	8	**2144** 2667	. .
254	Fujitsu VPX240/10	CESGA Sant. de Compostella Spain /1992	Academic	1	**2110** 2500	. .
255	Fujitsu VPX240/10	Fuji Denki Kagaku Japan /1994	Industry Chemistry	1	**2110** 2500	. .
256	Fujitsu VPX240/20	Fujitsu San Jose USA / .	Vendor	1	**2110** 2500	. .
257	Fujitsu VPX240/10	High Performance Computing Center Alberta Canada / .	Research	1	**2110** 2500	. .
258	SNI S400/10	IFP (Institute Francais du Petrole) Rueil-Malmaison France /1992	Academic Geophysics	1	**2110** 2500	. .
259	Fujitsu VPX240/10	University of Manchester Manchester UK /1993	Academic	1	**2110** 2500	. .
260	KSR KSR1-72	INRIA - Sophia Antipolis Rennes France /1994	Research	72	**2030** 2880	. .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
261	Intel XP/S5	Boeing Seattle USA /1992	Industry Aerospace	66	**2000** 3300	8000 .
262	Intel XP/S5	Intel CAD USA /1994	Vendor	66	**2000** 3300	8000 .
263	Intel XP/S5	Intel SSD Development Centers USA /1993	Vendor	66	**2000** 3300	8000 .
264	Intel XP/S5	Intel SSD Development Centers USA /1993	Vendor	66	**2000** 3300	8000 .
265	Intel XP/S5	Intel SSD Development Centers Munich Germany /1994	Vendor	66	**2000** 3300	8000 .
266	Intel XP/S5	Mitsubishi Electric Corporation Kanagawa Japan /1994	Industry Electronics	66	**2000** 3300	8000 .
267	Intel XP/S5	NASA/Langley Research Center Hampton USA /1992	Research	66	**2000** 3300	8000 .
268	Intel XP/S5	ONERA Chatillon France /1994	Research Aerospace	66	**2000** 3300	8000 .
269	Intel XP/S5	Oak Ridge National Laboratory Oak Ridge USA / .	Research	66	**2000** 3300	8000 .
270	Intel XP/S5	Prudential Bache Securities New York USA /1993	Industry	66	**2000** 3300	8000 .
271	Intel XP/S5	Real World Computing (RWC) Tokyo Japan /1993		66	**2000** 3300	8000 .
272	SGI Power Challenge	BMW AG/ Rolls-Royce Dahlewitz Germany /1994	Industry Aerospace	8	**2000** 2400	14000 1000
273	SGI Power Challenge	Bayer AG Leverkusen Germany /1994	Industry Chemistry	8	**2000** 2400	14000 1000
274	SGI Power Challenge	CERCA Montreal Canada /1994	Research	8	**2000** 2400	14000 1000
275	SGI Power Onyx	CSC (Centre for Sientific computing) Helsinki Finland /1994	Academic	8	**2000** 2400	14000 1000
276	SGI Power Onyx	Hong Kong University of Science and Technology Hong Kong Hong Kong /1994	Academic	8	**2000** 2400	14000 1000
277	SGI Power Challenge	Mobil Sugar Land USA /1994	Industry Geophysics	8	**2000** 2400	14000 1000
278	SGI Power Challenge	Silicon Graphics Hudson USA /1994	Vendor	8	**2000** 2400	14000 1000
279	SGI Power Challenge	Silicon Graphics GmbH Munich Germany /1994	Vendor	8	**2000** 2400	14000 1000
280	SGI Power Challenge	The Aeronautical Res. Inst. of Sweden Bromma Sweden /1994	Research	8	**2000** 2400	14000 1000

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
281	SGI Power Challenge	US Naval Research Laboratory Washington D.C. USA /1994	Research	8	**2000** 2400	14000 1000
282	SGI Power Onyx	US Naval Research Laboratory Washington D.C. USA /1994	Research	8	**2000** 2400	14000 1000
283	SGI Power Challenge	Western Geophysical Houston USA /1994	Industry Geophysics	8	**2000** 2400	14000 1000
284	IBM SP2/10	ING Bank Amsterdam Netherlands /1994	Industry Finance	10	**1950** 2660	. .
285	Intel XP/A4	Technische Universitaet Graz Graz Austria /1993	Academic	62	**1930** 3100	. .
286	Intel XP/A4	University of Trondheim Norway /1992	Academic	62	**1930** 3100	. .
287	TMC CM-5E/32	Hosei University Japan /1994	Academic	32	**1900** 5120	9216 4096
288	TMC CM-5/32	Australian National University Canberra Australia / .	Academic	32	**1900** 4096	9216 4096
289	TMC CM-5/32	Booz-Allen Hamilton Washington DC USA / .	Industry Consulting	32	**1900** 4096	9216 4096
290	TMC CM-5/32	CRIEPI Japan /1993		32	**1900** 4096	9216 4096
291	TMC CM-5/32	Columbia University New York City USA / .	Academic	32	**1900** 4096	9216 4096
292	TMC CM-5/32	Compagnie Generale de Geophysique (CGG) Massy France /1993	Industry Geophysics	32	**1900** 4096	9216 4096
293	TMC CM-5/32	Duke University Durham USA / .	Academic	32	**1900** 4096	9216 4096
294	TMC CM-5/32	Epsilon USA /1994	Industry	32	**1900** 4096	9216 4096
295	TMC CM-5/32	JPL Pasadena USA / .	Research	32	**1900** 4096	9216 4096
296	TMC CM-5/32	Lockheed White Sands USA /1994	Industry	32	**1900** 4096	9216 4096
297	TMC CM-5/32	Madentech USA /1993	Industry	32	**1900** 4096	9216 4096
298	TMC CM-5/32	Minnesota Supercomputer Center USA / .	Academic	32	**1900** 4096	9216 4096
299	TMC CM-5/32	NPAC Syracuse USA /1993	Research	32	**1900** 4096	9216 4096
300	TMC CM-5/32	National Center for Atmospheric Research Boulder USA / .	Research Weather	32	**1900** 4096	9216 4096

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
301	TMC CM-5/32	Saudi Aramco USA /1994	Industry	32	**1900** 4096	9216 4096
302	TMC CM-5/32	Site Experimental Hyperparallelisme (SEH/ETCA) Arcueil France / .	Research	32	**1900** 4096	9216 4096
303	TMC CM-5/32	Stanford University USA / .	Academic	32	**1900** 4096	9216 4096
304	TMC CM-5/32	TEC USA /1993	Industry	32	**1900** 4096	9216 4096
305	TMC CM-5/32	Tokyo University, Medical Lab Tokyo Japan /1993	Academic	32	**1900** 4096	9216 4096
306	TMC CM-5/32	Universidad Autonoma Metropolitana Istapalapa Mexico / .	Academic	32	**1900** 4096	9216 4096
307	TMC CM-5/32	Universitaet Wuppertal Wuppertal Germany /1992	Academic	32	**1900** 4096	9216 4096
308	TMC CM-5/32	University of Adelaide Adelaide Australia / .	Academic	32	**1900** 4096	9216 4096
309	TMC CM-5/32	University of Maryland USA / .	Academic	32	**1900** 4096	9216 4096
310	TMC CM-5/32	University of New South Wales Kensington Australia / .	Academic	32	**1900** 4096	9216 4096
311	TMC CM-5/32	University of Tennessee Knoxville USA / .	Academic	32	**1900** 4096	9216 4096
312	NCube nCube2S	Rutgers University USA / .	Academic	1024	**1900** 3600	21376 3193
313	NCube nCube2	Sandia National Labs Albuquerque USA / .	Research	1024	**1900** 2400	21376 3193
314	KSR KSR1-64	Caltech Pasadena USA /1992	Academic	64	**1838** 2560	9216 1536
315	KSR KSR1-64	Canon Japan /1993	Industry	64	**1838** 2560	9216 1536
316	KSR KSR1-64	Government Communications Headquarters UK /1992	Classified	64	**1838** 2560	9216 1536
317	KSR KSR1-64	Oak Ridge National Laboratory Oak Ridge USA /1991	Research	64	**1838** 2560	9216 1536
318	KSR KSR1-64	University of Colorado Boulder USA /1992	Academic	64	**1838** 2560	9216 1536
319	KSR KSR1-64	University of Manchester Manchester UK /1994	Academic	64	**1838** 2560	9216 1536
320	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1988	Vendor	1	**1817** 3000	. .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
321	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1988	Vendor	1	**1817** 3000	. .
322	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1989	Vendor	1	**1817** 3000	. .
323	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1989	Vendor	1	**1817** 3000	. .
324	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1990	Vendor	1	**1817** 3000	. .
325	Hitachi S-820/80	Hitachi Ltd. SSD Japan /1989	Vendor	1	**1817** 3000	. .
326	Hitachi S-820/80	Hokkaido University Sapporo Japan /1989	Academic	1	**1817** 3000	. .
327	Hitachi S-820/80	Nihon University Japan /1993	Academic	1	**1817** 3000	. .
328	IBM 9076-003 SP1	UCLA USA /1994	Academic	24	**1800** 3000	. .
329	Intel XP/A4	Caltech Pasadena USA /1993	Academic	56	**1750** 2800	6000 .
330	Intel XP/A4	George Mason University USA /1994	Academic	56	**1750** 2800	6000 .
331	Intel XP/A4	Hiroshima University Japan /1993	Academic	56	**1750** 2800	6000 .
332	Intel XP/A4	Intel SSD Development Centers Swindon UK /1994	Vendor	56	**1750** 2800	6000 .
333	Intel XP/A4	JPL USA /1994	Research	56	**1750** 2800	6000 .
334	Intel XP/A4	Rice University USA /1993	Academic	56	**1750** 2800	6000 .
335	Intel XP/A4	Sandia ATR USA /1993	Research Energy	56	**1750** 2800	6000 .
336	Intel XP/A4	Sandia National Labs Livermore USA /1993	Research Energy	56	**1750** 2800	6000 .
337	Intel XP/A4	State University of New York USA /1994	Academic	56	**1750** 2800	6000 .
338	Intel XP/A4	University of Indiana USA /1993	Academic	56	**1750** 2800	6000 .
339	Intel XP/A4	University of Melbourne Australia /1993	Academic	56	**1750** 2800	6000 .
340	Intel XP/A4	University of Puerto Rico USA /1994	Academic	56	**1750** 2800	6000 .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
341	Intel XP/A4	University of South Carolina USA /1992	Academic	56	**1750** 2800	6000 .
342	Convex SPP1000/XA-64	Josef Stefan Institut Ljubljana Slovenia /1994	Research	64	**1746** 12800	. .
343	Convex SPP1000/XA-48	Universitaet Erlangen Erlangen Germany /1994	Academic	48	**1746** 9600	. .
344	Convex SPP1000/XA-16	ENS Lyon France /1994	Research	16	**1746** 3200	. .
345	Convex SPP1000/XA-16	GSF Neuherberg Germany /1994	Research	16	**1746** 3200	. .
346	Convex SPP1000/XA-16	Goodyear USA /1994	Industry Automotive	16	**1746** 3200	. .
347	Convex SPP1000/XA-16	NCSA Urbana-Champaign USA /1994	Academic	16	**1746** 3200	. .
348	Convex SPP1000/XA-16	OPU Japan /1994	Industry	16	**1746** 3200	. .
349	Cray Y-MP M98	Cray Research Eagan USA / .	Vendor	8	**1733** 2667	. .
350	Cray Y-MP M98/82048	DOD/Defense Nuclear Agency USA /1994	Classified	8	**1733** 2667	. .
351	Cray Y-MP C94A/264	Alabama Supercomputer Center USA /1994	Academic	2	**1703** 1905	. .
352	Cray Y-MP C92A/2512	Bayer AG Leverkusen Germany /1994	Industry Chemistry	2	**1703** 1905	. .
353	Cray Y-MP C94/2128	CINECA Bologna Italy /1993	Academic	2	**1703** 1905	. .
354	Cray Y-MP C92A/264	Dow Chemical Corp. USA /1994	Industry Chemistry	2	**1703** 1905	. .
355	Cray Y-MP C92A/2128	Mitsubishi Motors Company Kawasaki Japan /1993	Industry Automotive	2	**1703** 1905	. .
356	Cray Y-MP C92A/2128	Uni-C Copenhagen Denmark /1993	Academic	2	**1703** 1905	. .
357	Fujitsu VP2400/20	Computer Technology Integrated (CTI) Japan /1991	Industry	1	**1688** 2000	. .
358	Hitachi S-3600/180	Bridgestone Japan /1994	Industry	1	**1672** 2000	. .
359	Hitachi S-3600/180	Hitachi Ltd. GPCD Japan /1993	Vendor	1	**1672** 2000	. .
360	Hitachi S-3600/180	Hitachi Ltd. GPCD Japan /1993	Vendor	1	**1672** 2000	. .

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N $_{world}$	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
361	Cray Y-MP8I/6128	NASA/Marshall Space Flight Center USA /1993	Research Aerospace	6	**1651** 2000	. .
362	Cray Y-MP8/664	Nissan Motor Kanagawa Japan /1990	Academic	6	**1651** 2000	. .
363	Cray Y-MP8I/632	Taiwan Central Weather Bureau Taiwan /1992	Research Weather	6	**1651** 2000	. .
364	Cray Y-MP8/632	Toyota Motor Company Japan /1991	Industry Automotive	6	**1651** 2000	. .
365	Cray Computer CRAY-3/2-256	NCAR USA /1994	Research	2	**1622** 1896	. .
366	MasPar MP-2216	EMBL Heidelberg Germany /1994	Research	16384	**1600** 2400	11264 1920
367	MasPar MP-2216	Inst. of Agriculture, Forest Fisheries Tsukuba Japan /1994	Research	16384	**1600** 2400	11264 1920
368	MasPar MP-2216	Lockheed Missiles and Space Company USA /1993	Industry Aerospace	16384	**1600** 2400	11264 1920
369	MasPar MP-2216	National Cancer Institute USA /1993	Research Chemistry	16384	**1600** 2400	11264 1920
370	MasPar MP-2216	National Cancer Research Institute Tokyo Japan /1994	Research	16384	**1600** 2400	11264 1920
371	MasPar MP-2216	University College Dublin Dublin Ireland /1994	Academic	16384	**1600** 2400	11264 1920
372	DEC DECmpp SX 200	University of Bergen Bergen Norway / .	Academic	16384	**1600** 2400	11264 1920
373	MasPar MP-2216	University of Melbourne Australia /1993	Academic	16384	**1600** 2400	11264 1920
374	IBM SP2/8	GMD Germany /1994	Research	8	**1600** 2120	9500 .
375	IBM SP2/8	Middle East Technical University Turkey /1994	Academic	8	**1600** 2120	9500 .
376	IBM SP2/8	Rice University USA /1993	Academic	8	**1600** 2120	9500 .
377	IBM SP2/8	Western Geophysical UK /1994	Industry Geophysics	8	**1600** 2120	9500 .
378	IBM SP2/8	debis Stuttgart Germany /1994	Industry Automotive	8	**1600** 2120	9500 .
379	Intel XP/A4E	IRISA Rennes France /1993	Research Aerospace	48	**1500** 2400	. .
380	Intel XP/A4E	University of Athen Athen Greece /1994	Academic	48	**1500** 2400	. .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
381	NEC SX-3/11R	Fukuoka University Japan /1994	Academic	1	**1500** 1600	2048 130
382	Parsytec GC PowerPlus/128	Japan Institute of Advanced Technology Japan /1994	Research	128	**1490** 10240	10240 .
383	Parsytec GC PowerPlus/128	Swedish National Supercomputer Centre Linkoping Sweden /1994	Academic	128	**1490** 10240	10240 .
384	Parsytec GC PowerPlus/128	Technische Universitaet Chemnitz Chemnitz Germany /1994	Academic	128	**1490** 10240	10240 .
385	Parsytec GC PowerPlus/128	Universitaet Hamburg-Harburg Hamburg-Harburg Germany /1994	Academic	128	**1490** 10240	10240 .
386	Parsytec GC PowerPlus/64	CRS4 Cagliari Italy /1994	Research	64	**1490** 5120	10240 .
387	Parsytec GC PowerPlus/64	University of Bergen Norway /1994	Academic	64	**1490** 5120	10240 .
388	SGI Power Onyx	ADN Oil Company Abu Dhabi Saudi Arabia/1994	Industry Geophysics	6	**1467** 1800	14000 1000
389	SGI Power Challenge	BASF Ludwigshafen Germany /1994	Industry Chemistry	6	**1467** 1800	14000 1000
390	SGI Power Challenge	European Space Agency (ESTEC) Noordwijk Netherlands /1994	Research	6	**1467** 1800	14000 1000
391	SGI Power Challenge	Forskningscenter Riso Riso Denmark /1994	Research	6	**1467** 1800	14000 1000
392	SGI Power Challenge	Instituto de Estudos do Mar Rio de Janeiro Brazil /1994	Research	6	**1467** 1800	14000 1000
393	SGI Power Challenge	Lockheed Aeronautical Systems Company Marietta USA /1994	Industry Aerospace	6	**1467** 1800	14000 1000
394	SGI Power Challenge	Pfizer Sandwich UK /1994	Industry Chemistry	6	**1467** 1800	14000 1000
395	SGI Power Challenge	Silicon Graphics Cortaillod Switzerland /1994	Vendor	6	**1467** 1800	14000 1000
396	SGI Power Challenge	Silicon Graphics Paris France /1994	Vendor	6	**1467** 1800	14000 1000
397	SGI Power Challenge	Silicon Graphics Theale UK /1994	Vendor	6	**1467** 1800	14000 1000
398	SGI Power Challenge	Silicon Graphics Theale UK /1994	Vendor	6	**1467** 1800	14000 1000
399	SGI Power Challenge	Stanford University Palo Alto USA /1994	Academic	6	**1467** 1800	14000 1000
400	SGI Power Challenge	The Aeronautical Res. Inst. of Sweden Bromma Sweden /1994	Research	6	**1467** 1800	14000 1000

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N $_{world}$	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
401	SGI Power Challenge	University of Chicago Chicago USA /1994	Academic	6	**1467** 1800	14000 1000
402	SGI Power Challenge	University of Pennsylvania Philadelphia USA /1994	Academic	6	**1467** 1800	14000 1000
403	SGI Power Challenge	University of Pennsylvania Philadelphia USA /1994	Academic	6	**1467** 1800	14000 1000
404	SGI Power Challenge	University of Twente Enschede Netherlands /1994	Academic	6	**1467** 1800	14000 1000
405	SGI Power Challenge	Volvo Gothenburg Sweden /1994	Industry Automotive	6	**1467** 1800	14000 1000
406	IBM ES 9000-900	CERN Geneva Switzerland / .	Research	6	**1457** 2664	. .
407	IBM ES 9000-900	Cornell Theory Center Ithaca USA / .	Academic	6	**1457** 2664	. .
408	IBM ES 9000-900	National Center for High Performance Computing Taiwan /1992	Research	6	**1457** 2664	. .
409	IBM ES 9000-900	UCLA Los Angeles USA / .	Academic	6	**1457** 2664	. .
410	Cray CRAY-2s/4-128	Lawrence Livermore National Laboratory Livermore USA /1988	Research Energy	4	**1406** 1952	. .
411	Cray CRAY-2s/4-128	NASA/Langley Research Center Hampton USA /1989	Research	4	**1406** 1952	. .
412	Cray CRAY-2s/4-128	NCSA Urbana-Champaign USA /1988	Academic	4	**1406** 1952	. .
413	Cray CRAY-2/4-512	Arabian American Oil Company Saudi Arabia/1992	Industry Geophysics	4	**1406** 1951	. .
414	Cray CRAY-2/4-128	Cray Research Eagan USA / .	Vendor	4	**1406** 1951	. .
415	Cray CRAY-2/4-256	Defense Research Agency Farnborough UK /1990	Classified	4	**1406** 1951	. .
416	Cray CRAY-2/4-256	Direction de la Meteorologie Nationale Toulouse France /1989	Research Weather	4	**1406** 1951	. .
417	Cray CRAY-2/4-512	Minnesota Supercomputer Center USA /1988	Academic	4	**1406** 1951	. .
418	Cray CRAY-2/4-256	NTT Japan /1987	Industry Electronics	4	**1406** 1951	. .
419	Cray CRAY-2/4-512	US Air Force/National Test Facility USA /1990	Classified	4	**1406** 1951	. .
420	Cray Y-MP8I/5128	Chrysler Motors Company USA /1993	Industry Automotive	5	**1405** 1666	. .

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
421	Cray Y-MP8E/5128	EXXON USA /1994	Industry Geophysics	5	**1405** 1666	. .
422	Cray Y-MP8I/564	National Center for Atmospheric Research Boulder USA /1994	Research Weather	5	**1405** 1666	. .
423	Intel iPSC/860	Caltech Pasadena USA /1990	Academic	64	**1400** 2560	9000 3500
424	Intel iPSC/860	McDonnell Douglas USA /1991	Industry Aerospace	64	**1400** 2560	9000 3500
425	Intel iPSC/860	SERC USA /1990	Research	64	**1400** 2560	9000 3500
426	Intel iPSC/860	Sandia National Labs Albuquerque USA /1991	Research	64	**1400** 2560	9000 3500
427	Intel iPSC/860	Superconducting Supercollider Lab USA /1990	Research	64	**1400** 2560	9000 3500
428	Intel iPSC/860	UCSD/San Diego Supercomputer Center San Diego USA /1990	Academic	64	**1400** 2560	9000 3500
429	Intel iPSC/860	Westinghouse Electric USA /1992	Industry Energy	64	**1400** 2560	9000 3500
430	KSR KSR1-48	North Carolina Supercomputer Center USA /1992	Academic	48	**1350** 1920	. .
431	KSR KSR1-48	University of Houston USA /1992	Academic	48	**1350** 1920	. .
432	Convex C4/XA-2	CEDEX Spain /1994	Research	2	**1335** 1620	. .
433	Convex C4/XA-2	NCTU Taiwan /1994	Academic	2	**1335** 1620	. .
434	Convex C4/XA-2	WPAFB USA /1994	Classified	2	**1335** 1620	. .
435	TMC CM-2/16k	ATR Kansai Japan /1990	Research	512	**1300** 3500	. .
436	TMC CM-2/16k	GMD Birlinghoven Germany /1990	Research	512	**1300** 3500	. .
437	TMC CM-2/16k	MIT Media Lab USA /1994	Research	512	**1300** 3500	. .
438	TMC CM-2/16k	NRIC Australia /1994	Academic	512	**1300** 3500	. .
439	Meiko CS/i860/64	University of Edinburgh Edinburgh UK /1990	Academic	64	**1300** 2500	8500 3500
440	NEC SX-3/11	National Scientific Research Center (NSRC) Singapore /1994	Research	1	**1300** 1370	2816 192

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N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
441	NEC SX-3/11	Sanyo Electric Moriguchi City Japan /1991	Industry Electronics	1	**1300** 1370	2816 192
442	NEC SX-3/11	Tokai University Tokai Japan /1992	Academic	1	**1300** 1370	2816 192
443	Parsytec GC PowerPlus/32	British Aerospace Warton UK /1994	Industry Aerospace	32	**1290** 2560	15360 .
444	Parsytec GC PowerPlus/32	ZIAM (Center for Industrial Appl. of MPPs) Herzogenrath Germany /1994	Industry	32	**1290** 2560	15360 .
445	SGI Challenge	Advanced Inst. for Science Ikoma City Japan /1993	Research	36	**1284** 2700	8000 2000
446	SGI Challenge	GFTA Duesseldorf-Erkarth Germany /1994	Industry Finance	36	**1284** 2700	8000 2000
447	SGI Challenge	GFTA Duesseldorf-Erkarth Germany /1994	Industry Finance	36	**1284** 2700	8000 2000
448	SGI Challenge	Lockheed Missles Space Res. Sunnyvale USA /1993	Research	36	**1284** 2700	8000 2000
449	SGI Challenge	Silicon Graphics Houston USA /1993	Vendor	36	**1284** 2700	8000 2000
450	SGI Challenge	Silicon Graphics Mountain View USA /1993	Vendor	36	**1284** 2700	8000 2000
451	Cray CS6400	Arco Oil and Gas Company Plano USA /1994	Industry Geophysics	32	**1268** 1920	5000 950
452	Cray CS6400	Cray Research Eagan USA /1994	Vendor	32	**1268** 1920	5000 950
453	Cray CS6400	SICAN Hannover Germany /1994	Industry	32	**1268** 1920	5000 950
454	SGI Challenge	NCSA Urbana-Champaign USA /1994	Research	32	**1254** 2400	8000 2000
455	SGI Challenge	Silicon Graphics Hudson USA /1993	Vendor	32	**1254** 2400	8000 2000
456	TMC CM-200/8k	KTH - Royal Institute of Technology Stockholm Sweden /1991	Academic	256	**1200** 2500	10752 4096
457	TMC CM-200/8k	Oregon State University USA /1994	Academic	256	**1200** 2500	10752 4096
458	TMC CM-200/8k	Uni-C Copenhagen Denmark /1992	Academic	256	**1200** 2500	10752 4096
459	IBM 9076-002 SP1	European Space Agency (ESTEC) Noordwijk Netherlands /1993	Research	16	**1200** 2000	12000 2300
460	IBM 9076-002 SP1	IBM Geoscience Center USA /1994	Industry Geophysics	16	**1200** 2000	12000 2300

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N $_{world}$	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
461	IBM 9076-002 SP1	National Center for High Performance Computing Taiwan /1994	Academic	16	**1200** 2000	12000 2300
462	IBM 9076-002 SP1	Shell KSLA Netherlands /1994	Industry Geophysics	16	**1200** 2000	12000 2300
463	IBM 9076-002 SP1	Stanford University USA /1994	Academic	16	**1200** 2000	12000 2300
464	Cray Y-MP8/4128	BMW AG Muenchen Germany /1992	Industry Automotive	4	**1159** 1333	. .
465	Cray Y-MP8E/4128	Boeing Seattle USA / .	Industry Aerospace	4	**1159** 1333	. .
466	Cray Y-MP4E/464	CSIRO (Commonwealth Scientific) Carlton Australia / .	Research	4	**1159** 1333	. .
467	Cray Y-MP4E/464	Citroen Peugeot Velizy France /1992	Industry Automotive	4	**1159** 1333	. .
468	Cray Y-MP4E/464	Compagnie Generale de Geophysique (CGG) Fletham UK /1993	Industry Geophysics	4	**1159** 1333	. .
469	Cray Y-MP4/432	Compagnie Generale de Geophysique (CGG) Massy France /1992	Industry Geophysics	4	**1159** 1333	. .
470	Cray Y-MP8/432	Defense Research Agency Ford Halstead UK /1990	Research	4	**1159** 1333	. .
471	Cray Y-MP4/432	Deutscher Wetterdienst Offenbach Germany /1990	Research Weather	4	**1159** 1333	. .
472	Cray Y-MP4/432	Du Pont De Nemours Company USA /1993	Industry Chemistry	4	**1159** 1333	. .
473	Cray Y-MP4/464	Eidgenoessische Technische Hochschule Zuerich Switzerland /1992	Academic	4	**1159** 1333	. .
474	Cray Y-MP8/464	Fiat Torino Italy /1993	Industry Automotive	4	**1159** 1333	. .
475	Cray Y-MP4/432	Florida State University Tallahassee USA /1990	Academic	4	**1159** 1333	. .
476	Cray Y-MP4/464	Grumman Johnson Space Center USA /1993	Research Aerospace	4	**1159** 1333	. .
477	Cray Y-MP4E/464	Hyundai Korea /1993	Industry Automotive	4	**1159** 1333	. .
478	Cray Y-MP4E/464	Lockheed Aeronautical Systems Company Marietta USA /1992	Industry Aerospace	4	**1159** 1333	. .
479	Cray Y-MP8I/4128	Lockheed Aeronautical Systems Company Marietta USA /1993	Industry Aerospace	4	**1159** 1333	. .
480	Cray Y-MP4E/464	MPI Garching Germany /1991	Research	4	**1159** 1333	. .

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TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
481	Cray Y-MP4E/464	Matsushita Electric Osaka Japan /1992	Academic	4	**1159** 1333	. .
482	Cray Y-MP8I/4128	Merck Co USA /1993	Industry Chemistry	4	**1159** 1333	. .
483	Cray Y-MP4/464	Mitsubishi Motors Company Okazaki Japan /1992	Industry Automotive	4	**1159** 1333	. .
484	Cray Y-MP4/464	NCSA Urbana-Champaign USA /1990	Academic	4	**1159** 1333	. .
485	Cray Y-MP8/464	North Carolina Supercomputer Center USA /1991	Academic	4	**1159** 1333	. .
486	Cray Y-MP8/4128	ONERA Chatillon France /1991	Research Aerospace	4	**1159** 1333	. .
487	Cray Y-MP4E/464	Renault Rueil-Malmaison France /1994	Industry Automotive	4	**1159** 1333	. .
488	Cray Y-MP4E/464	Samsung Korea /1991	Industry Electronics	4	**1159** 1333	. .
489	Cray Y-MP8/464	Swedish National Supercomputer Centre Linkoping Sweden /1993	Academic	4	**1159** 1333	. .
490	Cray Y-MP8/4128	Toshiba Kanagawa Japan /1990	Academic	4	**1159** 1333	. .
491	Cray Y-MP4/464	Universidad Nacional Autonoma de Mexico Mexico /1994	Academic	4	**1159** 1333	. .
492	Cray Y-MP4E/464	Universitaet Kaiserslautern Kaiserslautern Germany /1993	Academic	4	**1159** 1333	. .
493	Cray Y-MP4/464	University of Trondheim Norway /1992	Academic	4	**1159** 1333	. .
494	Cray Y-MP8/464	VW (Volkswagen AG) Wolfsburg Germany /1993	Industry Automotive	4	**1159** 1333	. .
495	Cray Y-MP4/464	ZIB/Konrad Zuse-Zentrum fuer Informationstechnik Berlin Germany /1994	Academic	4	**1159** 1333	. .
496	SGI Challenge	Silicon Graphics Mountain View USA /1993	Vendor	28	**1153** 2100	8000 2000
497	SGI Challenge	Silicon Graphics Mountain View USA /1994	Vendor	28	**1153** 2100	8000 2000
498	Cray Y-MP M98/41024	University of Alaska Fairbanks USA /1992	Academic	4	**1114** 1333	. .
499	Cray Y-MP M94/4512	Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1993	Academic	4	**1114** 1333	. .
500	Cray Y-MP M94/4256	KFA Juelich Germany /1993	Research	4	**1114** 1333	. .

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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. A comprehensive report of 300 pages, based on the data of the TOP500 list, is also published. 1993 [4]

Table 2: Number of Systems Installed

TOP500 Statistics — Number of Systems Installed					
	USA	Europe	Japan	others	Total
Cray	78	48	11	9	146
TMC	46	11	8	5	70
Intel	47	14	4	2	67
SGI	31	24	1	4	60
IBM	16	12	1	3	32
NEC	3	3	15	2	23
Fujitsu	2	2	18		22
KSR	14	4	2		20
Hitachi			18		18
Convex	4	5	1	1	11
Parsytec		7	1		8
MasPar/DEC	2	3	2	1	8
SNI		7			7
Meiko	1	3			4
Cray Computer	2				2
NCube	2				2
Total	248	143	82	27	500

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Table 3: Installed **Rmax**

TOP500 Statistics — Installed R_{max} [Gflop/s]					
	USA	Europe	Japan	others	Total
Cray	417.1	205.3	44.9	25.7	693.0
TMC	377.9	28.3	26.1	8.9	441.2
Intel	313.7	33.6	15.8	5.9	368.9
SGI	69.1	48.0	1.3	8.6	127.0
IBM	93.3	39.1	6.1	6.8	145.3
NEC	48.2	28.2	124.3	4.2	204.9
Fujitsu	4.2	4.2	354.5		362.9
KSR	44.3	12.1	4.4		60.8
Hitachi			125.2		125.2
Convex	7.4	8.3	1.7	1.3	18.8
Parsytec		10.0	1.5		11.5
MasPar/DEC	3.2	4.8	3.2	1.6	12.8
SNI		28.6			28.6
Meiko	5.0	6.9			11.9
Cray Computer	4.5				4.5
NCube	3.8				3.8
Total	1391.7	457.3	708.9	63.1	2620.9

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

TOP500 Statistics — Installed R_{peak} [Gflop/s]					
	USA	Europe	Japan	others	Total
Cray	516.9	264.9	58.4	29.9	870.0
TMC	829.0	62.0	61.4	19.9	972.2
Intel	473.2	57.4	26.2	9.8	566.5
SGI	95.1	61.8	2.7	11.4	171.0
IBM	395.0	55.6	8.5	10.5	469.6
NEC	53.5	31.5	138.4	4.6	228.0
Fujitsu	5.0	5.0	458.5		468.5
KSR	67.8	16.8	6.4		91.0
Hitachi			150.0		150.0
Convex	11.3	30.4	3.2	1.6	46.5
Parsytec		46.1	10.2		56.3
MasPar/DEC	4.8	7.2	4.8	2.4	19.2
SNI		35.3			35.3
Meiko	23.0	14.1			37.1
Cray Computer	5.7				5.7
NCube	6.0				6.0
Total	2486.3	688.0	928.7	90.0	4193.0

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