TOP500 Supercomputer Sites

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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.

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 *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
1	Intel XP/S140	Sandia National Labs Albuquerque USA /1993	Research	3680	**143400** 184000	55700 20500
2	Fujitsu Numerical Wind Tunnel	NAL Japan /1993	Research Aerospace	140	**124500** 236000	31920 11950
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	**32800** 48000	. .
6	Fujitsu VPP500/30	Tsukuba University Tsukuba Japan /1993	Research	30	**32800** 48000	. .
7	Fujitsu VPP500/28	Institute of Physical and Chemical Res. (RIKEN) Tokyo Japan /1993	Research	28	**30800** 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	Tokyo University Tokyo Japan /1993	Academic	4	**27500** 32000	15020 870
12	NEC SX-3/44R	NEC Fuchu Plant Japan /1990	Vendor	4	**23200** 26000	6400 830
13	NEC SX-3/44R	Tohoku University Tohoku Japan /1993	Academic	4	**23200** 26000	6400 830
14	Cray T3D MC256-8	Cray Research Eagan USA /1994	Vendor	256	**21400** 38000	38912 4768
15	Cray T3D MC256-8	Pittsburgh Supercomputing Center Pittsburgh USA /1994	Academic	256	**21400** 38000	38912 4768
16	Cray T3D MC256-8	University of Edinburgh Edinburgh UK /1994	Academic	256	**21400** 38000	38912 4768
17	Hitachi S-3800/380	University of Tohoku Japan /1994	Academic	3	**21300** 24000	15020 690
18	NEC SX-3/44	Atmospheric Environment Service (AES) Dorval Canada /1991	Research Weather	4	**20000** 22000	6144 832
19	NEC SX-3/34R	National Inst. for Molecular Science Japan /1993	Research	3	**17400** 19500	6144 691
20	Intel XP/S35	CSCC TRex USA /1994	Research	512	**15200** 26000	23000 9000

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21	Intel XP/S35	Oak Ridge National Laboratory Oak Ridge USA /1992	Research	512	**15200** 26000	23000 9000
22	TMC CM-5/256	Goverment USA /1993	Classified	256	**15100** 33000	26112 12032
23	TMC CM-5/256	Thinking Machines USA /1993	Vendor	256	**15100** 33000	26112 12032
24	TMC CM-5/256	US Naval Research Laboratory USA /1992	Research	256	**15100** 33000	26112 12032
25	Intel XP/S35	NAL Japan /1994	Research	480	**14200** 24000	. .
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 NERSC 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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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	Intel XP/S30	UCSD/San Diego Supercomputer Center San Diego USA /1993	Academic	400	**11900** 20000	. .
46	Fujitsu VPP500/10	Communications Res. Lab. (CRL) Tokyo Japan /1993	Research	10	**11700** 16000	. .
47	NEC SX-3/24R	German Aerospace Laboratory (DLR) Goettingen Germany /1994	Research Aerospace	2	**11600** 13000	4352 516
48	NEC SX-3/24R	NEC Fuchu Plant Japan /1994	Vendor	2	**11600** 13000	4352 516
49	NEC SX-3/24R	National Institute of Fusion Science (NIFS) Japan /1993	Research	2	**11600** 13000	4352 516
50	NEC SX-3/24R	Swiss Scientific Computing Center Manno Switzerland /1994	Research	2	**11600** 13000	4352 516
51	Cray T3D MC128-2	CEA/Centre d'Etudes Limeil-Valenton France /1993	Research	128	**10700** 19000	24576 3264
52	Cray T3D SC128-2/264	Caltech/JPL Pasadena USA /1994	Academic	128	**10700** 19000	24576 3264
53	Cray T3D MC128-2	Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1994	Academic	128	**10700** 19000	24576 3264
54	Cray T3D MC128-2	Minnesota Supercomputer Center USA /1994	Academic	128	**10700** 19000	24576 3264
55	Cray T3D MC128-2	Reactor Nuclear Fuel Development Japan /1994	Research	128	**10700** 19000	24576 3264
56	Cray T3D MC128-2	University of Alaska Fairbanks USA /1994	Academic	128	**10700** 19000	24576 3264
57	Cray Y-MP C916/12256	DKRZ Hamburg Germany /1994	Research Weather	12	**10270** 11430	. .
58	Intel XP/S25	NRAD USA /1994	Research	336	**10000** 16800	. .
59	TMC CM-200/64k	Los Alamos National Laboratory Los Alamos USA / .	Research Energy	2048	**9800** 20000	29696 11264
60	TMC CM-200/64k	Los Alamos National Laboratory Los Alamos USA / .	Research Energy	2048	**9800** 20000	29696 11264

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61	TMC CM-5/160	Schlumberger Well Services Houston USA /1992	Industry Geophysics	160	**9500** 20500	. .
62	Fujitsu VPP500/7	Institute of Space Astronautical Science (ISAS) Tokyo Japan /1993	Research	7	**8300** 11375	. .
63	TMC CM-5E/128	The Angstrom Technology Partnership Tsukuba Japan /1994	Research	128	**7700** 20000	18432 8192
64	TMC CM-5/128	AMEX USA /1993	Industry	128	**7700** 16000	18432 8192
65	TMC CM-5/128	Goverment USA /1993	Classified	128	**7700** 16000	18432 8192
66	TMC CM-5/128	Institut de Physique du Globe de Paris (IPG) Paris France /1992	Research	128	**7700** 16000	18432 8192
67	TMC CM-5/128	MIT Cambridge USA / .	Research	128	**7700** 16000	18432 8192
68	TMC CM-5/128	Mobil / Technical Center Tulsa USA /1992	Industry Geophysics	128	**7700** 16000	18432 8192
69	TMC CM-5/128	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	128	**7700** 16000	18432 8192
70	Intel XP/S20	Wright Patterson AFB USA /1994	Research	256	**7600** 12800	16000 4000
71	Hitachi S-3800/180	Hitachi LTD. Energy Res. Lab. Japan /1993	Vendor	1	**7400** 8000	15020 390
72	Hitachi S-3800/180	Meteorological Research Institute Japan /1993	Research Weather	1	**7400** 8000	15020 390
73	KSR KSR2-128	KSR Boston USA /1994	Vendor	128	**6923** 10240	9280 4128
74	Cray Y-MP C98/8512	CNRS Orsay France /1993	Research	8	**6850** 7619	. .
75	Cray Y-MP C98/8512	Cray Research Eagan USA / .	Vendor	8	**6850** 7619	. .
76	Cray Y-MP C916/8512	Ford Motor Company Dearborn USA /1994	Industry Automotive	8	**6850** 7619	. .
77	Cray Y-MP C916/8512	Minnesota Supercomputer Center USA /1994	Academic	8	**6850** 7619	. .
78	Cray Y-MP C916/8256	NASA/Ames Research Center/CCF Moffett Field USA /1993	Research Aerospace	8	**6850** 7619	. .
79	Cray Y-MP C98/8128	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	8	**6850** 7619	. .
80	Cray Y-MP C98/8128	UCSD/San Diego Supercomputer Center San Diego USA /1993	Academic	8	**6850** 7619	. .

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81	Cray Y-MP C916/8128	US Navy/Fleet Numerical Oceanography Center Monterey USA /1992	Research Weather	8	**6850** 7619	. .
82	KSR KSR2-110	Leibniz Rechenzentrum Muenchen Germany /1994	Academic	110	**6380** 8800	. .
83	IBM SP2/32	Maui High-Performance Computing Center USA /1994	Research	32	**6250** 8500	. .
84	Intel XP/S15	NASA/Ames Research Center/NAS Moffett Field USA /1992	Research	208	**6200** 10400	. .
85	Intel XP/S15	NOAA USA /1994	Research	208	**6200** 10400	. .
86	NEC SX-3/41R	Japan Atomic Energy Research Japan /1992	Research	4	**5800** 6400	3584 414
87	NEC SX-3/14R	Osaka University Osaka Japan /1993	Academic	1	**5800** 6400	2816 282
88	NEC SX-3/14R	Toyota Central Research Japan /1992	Industry Automotive	1	**5800** 6400	2816 282
89	TMC CM-5/96	University of California at Berkeley USA / .	Academic	96	**5700** 13370	. .
90	Cray T3D MC64-2	Cray Research Eagan USA /1994	Vendor	64	**5300** 9600	17408 2224
91	TMC CM-2/64k	Brandeis University USA / .	Academic	2048	**5200** 14000	26624 11000
92	TMC CM-2/64k	Florida State University Tallahassee USA / .	Academic	2048	**5200** 14000	26624 11000
93	TMC CM-2/64k	SRC USA /1993	Industry	2048	**5200** 14000	26624 11000
94	TMC CM-200/32k	Minnesota Supercomputer Center USA / .	Academic	1024	**5000** 10000	21504 8192
95	TMC CM-200/32k	Western Geophysical USA /1994	Industry Geophysics	1024	**5000** 10000	21504 8192
96	NEC SX-3/22	Houston Advanced Research Center Houston USA /1991	Research	2	**5000** 5500	3072 384
97	NEC SX-3/14	IBM Japan Tokyo Japan /1991	Industry Electronics	1	**5000** 5500	3072 384
98	NEC SX-3/22	National Aerospace Laboratory (NLR) Nordoostpolder Netherlands /1992	Research Aerospace	2	**5000** 5500	3072 384
99	NEC SX-3/14	National Institute of Environmental Studies Japan /1992	Research Environment	1	**5000** 5500	3072 384
100	IBM 9076-005 SP1	Argonne Nat. Lab USA /1993	Academic	128	**4800** 16000	26000 6000

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101	IBM 9076-004 SP1	Cornell University USA /1993	Academic	64	**4800** 8000	26000 6000
102	SNI VPP500/4	Universitaet Aachen Aachen Germany /1993	Academic	4	**4800** 6400	. .
103	KSR KSR2-80	Pacific Northwest Laboratories/Batelle Richland USA /1994	Research	80	**4770** 6400	. .
104	Cray Y-MP C98/6256	NASA/Goddard Space Flight Center Greenbelt USA /1993	Research Weather	6	**4630** 5715	. .
105	Intel XP/S10	Intel SSD Development Centers USA /1992	Vendor	140	**4100** 7000	. .
106	Intel XP/S10	KFA Juelich Germany /1994	Research	140	**4100** 7000	. .
107	Intel XP/S10	National Security Agency USA /1994	Classified	140	**4100** 7000	. .
108	Intel XP/S10	Purdue University USA /1994	Academic	140	**4100** 7000	. .
109	Fujitsu VP2600/10	Fuji Heavy Japan /1990	Industry Heavy Ind.	1	**4009** 5000	. .
110	Fujitsu VP2600/10	Japan Atomic Energy Research Japan /1991	Research	1	**4009** 5000	. .
111	Fujitsu VP2600/10	Japan Atomic Energy Research Japan /1991	Research	1	**4009** 5000	. .
112	Fujitsu VP2600/20	Kyoto University Kyoto Japan /1990	Academic	1	**4009** 5000	. .
113	Fujitsu VP2600/10	Kyushu University Kyushu Japan /1992	Academic	1	**4009** 5000	. .
114	Fujitsu VP2600/10	NAL (Space Technology) Japan /1990	Research	1	**4009** 5000	. .
115	Fujitsu VP2600/10	Nagoya University Nagoya Japan /1991	Academic	1	**4009** 5000	. .
116	Fujitsu VP2600/10	Reactor Nuclear Fuel Development Japan /1991	Research	1	**4009** 5000	. .
117	Fujitsu VP2600/10	Reactor Nuclear Fuel Development Japan /1991	Research	1	**4009** 5000	. .
118	Fujitsu VP2600/10	Taisei Construction Japan /1992	Industry Construction	1	**4009** 5000	. .
119	SNI S600/20	Universitaet Aachen Aachen Germany /1991	Academic	1	**4009** 5000	. .
120	SNI S600/20	Universitaet Karlsruhe Karlsruhe Germany /1990	Academic	1	**4009** 5000	. .

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121	Cray Y-MP C98/5256	Electricite de France Clamart France /1993	Industry Energy	5	**3952** 4762	. .
122	TMC CM-5/64	AMOCO Tulsa USA / .	Industry Geophysics	64	**3800** 8192	13056 6016
123	TMC CM-5/64	ATR Kyoto Japan / .		64	**3800** 8192	13056 6016
124	TMC CM-5/64	Boston University Boston USA / .	Academic	64	**3800** 8192	13056 6016
125	TMC CM-5/64	EPS USA /1993	Industry	64	**3800** 8192	13056 6016
126	TMC CM-5/64	GMD Birlinghoven Germany /1993	Research	64	**3800** 8192	13056 6016
127	TMC CM-5/64	Japanese AIST Hokuriku Japan /1993		64	**3800** 8192	13056 6016
128	TMC CM-5/64	Oregon State University USA / .	Academic	64	**3800** 8192	13056 6016
129	TMC CM-5/64	Real World Computing (RWCP) Tokyo Japan /1992	Classified	64	**3800** 8192	13056 6016
130	TMC CM-5/64	University of Wisconsin USA / .	Academic	64	**3800** 8192	13056 6016
131	SNI S400/40	Universitaet Darmstadt Darmstadt Germany /1991	Academic	2	**3624** 5000	10239 .
132	SNI S400/40	Universitaet Hannover Hannover Germany /1991	Academic	2	**3624** 5000	10239 .
133	Intel XP/S8	National Security Agency USA /1994	Classified	110	**3400** 5500	. .
134	KSR KSR1-256	US Army Research Laboratory Aberdeen USA /1993	Research	256	**3380** 10240	10240 1824
135	KSR KSR1-128	Cornell Theory Center Ithaca USA /1992	Academic	128	**3380** 5120	10240 1824
136	Cray Y-MP C98/4256	Direction de la Meteorologie Nationale Toulouse France /1993	Research Weather	4	**3275** 3810	. .
137	Cray Y-MP C94A/4128	Instituto National de Meteorologia (INM) Spain /1993	Research Weather	4	**3275** 3810	. .
138	Cray Y-MP C98/4256	SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1994	Academic	4	**3275** 3810	. .
139	Cray Y-MP C94/41024	Universitaet Stuttgart Stuttgart Germany /1994	Research	4	**3275** 3810	. .
140	Cray Y-MP C94/4128	debis Stuttgart Germany /1994	Industry Automotive	4	**3275** 3810	. .

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141	Intel XP/S7	ETH Zuerich Switzerland /1994	Academic	96	**3000** 4800	. .
142	Intel XP/S7	University of Bergen Bergen Norway /1994	Academic	96	**3000** 4800	. .
143	NEC SX-3/12R	Institute of Space Science (INPE) Brazil /1994	Research Weather	1	**2900** 3200	2048 174
144	NEC SX-3/12R	NEC Scientific Information (NSIS) Japan /1992	Research	1	**2900** 3200	2048 174
145	NEC SX-3/21R	Obayashi Corporation Japan /1992	Industry	2	**2900** 3200	2560 257
146	TMC CM-2/32k	AMK Bonn Germany /1990	Classified	1024	**2600** 7000	. .
147	TMC CM-2/32k	Columbia Law School USA /1994	Academic	1024	**2600** 7000	. .
148	Intel iPSC/860	Alliant Techsystems Inc. USA /1990	Industry Biochemistry	128	**2600** 5120	12000 4500
149	Intel iPSC/860	Grant Tensor UK /1991	Industry Geophysics	128	**2600** 5120	12000 4500
150	Intel iPSC/860	Grant Tensor USA /1991	Industry Geophysics	128	**2600** 5120	12000 4500
151	Intel iPSC/860	Grant Tensor Houston USA /1992	Industry Geophysics	128	**2600** 5120	12000 4500
152	Intel iPSC/860	Honeywell USA /1990	Industry	128	**2600** 5120	12000 4500
153	Intel iPSC/860	Lockheed Advanced Development Palmdale USA /1992	Industry Aerospace	128	**2600** 5120	12000 4500
154	Intel iPSC/860	NASA/Ames Research Center/NAS Moffett Field USA /1990	Research	128	**2600** 5120	12000 4500
155	Intel iPSC/860	NIH Frederick USA /1990	Research	128	**2600** 5120	12000 4500
156	Intel iPSC/860	ONERA Chatillon France /1991	Research Aerospace	128	**2600** 5120	12000 4500
157	Intel iPSC/860	Oak Ridge National Laboratory Oak Ridge USA /1989	Research	128	**2600** 5120	12000 4500
158	KSR KSR1-96	Florida State University Tallahassee USA /1993	Academic	96	**2535** 3840	. .
159	KSR KSR1-96	University of Cincinati USA /1993	Academic	96	**2535** 3840	. .
160	Cray Y-MP C94/3256	Commissariat a l'Energie Atomique Grenoble France /1994	Research Energy	3	**2489** 2857	. .

TOP500 Supercomputers - Worldwide

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
161	TMC CM-200/16k	INRIA - Sophia Antipolis Rennes France /1992	Research	512	**2400** 5000	14848 5632
162	TMC CM-200/16k	US Naval Research Laboratory USA /1987	Research	512	**2400** 5000	14848 5632
163	TMC CM-200/16k	University of Edinburgh Edinburgh UK / .	Academic	512	**2400** 5000	14848 5632
164	IBM 9076-003 SP1	Penn State University USA /1993	Academic	32	**2400** 4000	16000 4000
165	Intel XP/S5	Maryland Procurment Office (MPO) USA /1994	Research	72	**2200** 3600	. .
166	Intel XP/S5	NASA/Langley Research Center Hampton USA /1992	Research	72	**2200** 3600	. .
167	Intel XP/S5	NAWC USA /1994	Research	72	**2200** 3600	. .
168	Intel XP/S5	Universitaet Stuttgart Stuttgart Germany /1992	Academic	72	**2200** 3600	. .
169	Cray CRAY-2s/8-128	Lawrence Livermore National Laboratory NERSC USA /1990	Research Energy	8	**2171** 3902	. .
170	Cray Y-MP8E/8256	Arabian American Oil Company Saudi Arabia/1991	Industry Geophysics	8	**2144** 2667	. .
171	Cray Y-MP8/864	Atomic Weapons Establishment USA /1990	Classified	8	**2144** 2667	. .
172	Cray Y-MP8/864	Atomic Weapons Establishment Aldermaston UK / .	Classified	8	**2144** 2667	. .
173	Cray Y-MP8/8128	Commissariat a l'Energie Atomique Limeil France /1991	Research Energy	8	**2144** 2667	. .
174	Cray Y-MP8/8128	Cray Research Eagan USA / .	Vendor	8	**2144** 2667	. .
175	Cray Y-MP8/832	Cray Research Eagan USA / .	Vendor	8	**2144** 2667	. .
176	Cray Y-MP8/8128	DOD/CEWES Vicksburg USA /1993	Research Mechanics	8	**2144** 2667	. .
177	Cray Y-MP8/864	DOE/Bettis Atomic Power Laboratory USA /1990	Research	8	**2144** 2667	. .
178	Cray Y-MP8/864	DOE/Knolls Atomic Power Laboratory USA /1990	Research	8	**2144** 2667	. .
179	Cray Y-MP8/8256	DOE/National Security Agency USA / .	Classified	8	**2144** 2667	. .
180	Cray Y-MP8/864	KFA Juelich Germany /1993	Research	8	**2144** 2667	. .

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
181	Cray Y-MP8/8128	Lawrence Livermore National Laboratory Livermore USA /1991	Research	8	**2144** 2667	. .
182	Cray Y-MP8/864	Lawrence Livermore National Laboratory Livermore USA /1992	Research	8	**2144** 2667	. .
183	Cray Y-MP8/8128	Leibniz Rechenzentrum Muenchen Germany /1992	Academic	8	**2144** 2667	. .
184	Cray Y-MP8/8128	Los Alamos National Laboratory Los Alamos USA /1992	Research Energy	8	**2144** 2667	. .
185	Cray Y-MP8/864	Los Alamos National Laboratory Los Alamos USA /1992	Research Energy	8	**2144** 2667	. .
186	Cray Y-MP8/8256	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	8	**2144** 2667	. .
187	Cray Y-MP8E/8256	NASA/Langley Research Center Hampton USA /1992	Research	8	**2144** 2667	. .
188	Cray Y-MP8/8128	NASA/Lewis Research Center USA /1991	Research	8	**2144** 2667	. .
189	Cray Y-MP8/864	NOAA USA /1990	Research Weather	8	**2144** 2667	. .
190	Cray Y-MP8/832	NOAA/GFDL USA /1990	Research Weather	8	**2144** 2667	. .
191	Cray Y-MP8/8128	National Cancer Institute USA /1991	Research Chemistry	8	**2144** 2667	. .
192	Cray Y-MP8/864	National Center for Atmospheric Research Boulder USA /1990	Research Weather	8	**2144** 2667	. .
193	Cray Y-MP8E/8128	Navy POPS Supercomputing Facility Saint Louis USA / .	Research Weather	8	**2144** 2667	. .
194	Cray Y-MP8/864	Ohio Supercomputer Center Columbus USA /1989	Academic	8	**2144** 2667	. .
195	Cray Y-MP8I/8128	Rutherford Appleton Laboratory UK /1992	Research	8	**2144** 2667	. .
196	Cray Y-MP8/864	Sandia National Labs Albuquerque USA / .	Research	8	**2144** 2667	. .
197	Cray Y-MP8/8128	Tohoku University, Institute of Fluid Science Aramaki Japan /1992	Academic	8	**2144** 2667	. .
198	Cray Y-MP8/864	University of Texas Austin USA /1990	Academic	8	**2144** 2667	. .
199	Fujitsu VPX240/10	CESGA Sant. de Compostella Spain /1992	Academic	1	**2110** 2500	. .
200	Fujitsu VPX240/20	Fujitsu San Jose USA / .	Vendor	1	**2110** 2500	. .

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N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
201	Fujitsu VPX240/10	High Performance Computing Center Alberta Canada / .	Research	1	**2110** 2500	. .
202	SNI S400/10	IFP (Institute Francais du Petrole) Rueil-Malmaison France /1992	Academic Geophysics	1	**2110** 2500	. .
203	Fujitsu VPX240/10	University of Manchester Manchester UK /1993	Academic	1	**2110** 2500	. .
204	KSR KSR1-72	INRIA - Sophia Antipolis Rennes France /1994	Research	72	**2030** 2880	. .
205	Intel XP/S5	Boeing Seattle USA /1992	Industry Aerospace	66	**2000** 3300	8000 .
206	Intel XP/S5	DOE/Bettis Atomic Power Laboratory USA /1994	Research	66	**2000** 3300	8000 .
207	Intel XP/S5	Grand Tensor USA /1994	Industry Geophysics	66	**2000** 3300	8000 .
208	Intel XP/S5	Intel CAD USA /1994	Vendor	66	**2000** 3300	8000 .
209	Intel XP/S5	Intel SSD Development Centers USA /1993	Vendor	66	**2000** 3300	8000 .
210	Intel XP/S5	Intel SSD Development Centers USA /1993	Vendor	66	**2000** 3300	8000 .
211	Intel XP/S5	Intel SSD Development Centers Munich Germany /1994	Vendor	66	**2000** 3300	8000 .
212	Intel XP/S5	Mitsubishi Electric Corporation Kanagawa Japan /1994	Industry Electronics	66	**2000** 3300	8000 .
213	Intel XP/S5	ONERA Chatillon France /1994	Research Aerospace	66	**2000** 3300	8000 .
214	Intel XP/S5	Oak Ridge National Laboratory Oak Ridge USA / .	Research	66	**2000** 3300	8000 .
215	Intel XP/S5	Prudential Bache Securities New York USA /1993	Industry	66	**2000** 3300	8000 .
216	Intel XP/S5	Real World Computing (RWC) Tokyo Japan /1993		66	**2000** 3300	8000 .
217	Intel XP/A4	University of Melbourne Australia /1993	Academic	62	**1930** 3100	. .
218	TMC CM-5E/32	Hosei University Japan /1994	Academic	32	**1900** 5120	9216 4096
219	TMC CM-5/32	Australian National University Canberra Australia / .	Academic	32	**1900** 4096	9216 4096
220	TMC CM-5/32	Booz-Allen Hamilton Washington DC USA / .	Industry Consulting	32	**1900** 4096	9216 4096

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
221	TMC CM-5/32	CRIEPI Japan /1993		32	**1900** 4096	9216 4096
222	TMC CM-5/32	Columbia University New York City USA / .	Academic	32	**1900** 4096	9216 4096
223	TMC CM-5/32	Compagnie Generale de Geophysique (CGG) Massy France /1993	Industry Geophysics	32	**1900** 4096	9216 4096
224	TMC CM-5/32	Duke University Durham USA / .	Academic	32	**1900** 4096	9216 4096
225	TMC CM-5/32	Epsilon USA /1994	Industry	32	**1900** 4096	9216 4096
226	TMC CM-5/32	JPL Pasadena USA / .	Research	32	**1900** 4096	9216 4096
227	TMC CM-5/32	Lockheed White Sands USA /1994	Industry	32	**1900** 4096	9216 4096
228	TMC CM-5/32	Madentech USA /1993	Industry	32	**1900** 4096	9216 4096
229	TMC CM-5/32	Minnesota Supercomputer Center USA / .	Academic	32	**1900** 4096	9216 4096
230	TMC CM-5/32	NPAC Syracuse USA /1993	Research	32	**1900** 4096	9216 4096
231	TMC CM-5/32	National Center for Atmospheric Research Boulder USA / .	Research Weather	32	**1900** 4096	9216 4096
232	TMC CM-5/32	Saudi Aramco USA /1994	Industry	32	**1900** 4096	9216 4096
233	TMC CM-5/32	Site Experimental Hyperparallelisme (SEH/ETCA) Arcueil France / .	Research	32	**1900** 4096	9216 4096
234	TMC CM-5/32	Stanford University USA / .	Academic	32	**1900** 4096	9216 4096
235	TMC CM-5/32	TEC USA /1993	Industry	32	**1900** 4096	9216 4096
236	TMC CM-5/32	Tokyo University, Medical Lab Tokyo Japan /1993	Academic	32	**1900** 4096	9216 4096
237	TMC CM-5/32	Universidad Autonoma Metropolitana Spain / .	Academic	32	**1900** 4096	9216 4096
238	TMC CM-5/32	Universitaet Wuppertal Wuppertal Germany /1992	Academic	32	**1900** 4096	9216 4096
239	TMC CM-5/32	University of Adelaide Adelaide Australia / .	Academic	32	**1900** 4096	9216 4096
240	TMC CM-5/32	University of Maryland USA / .	Academic	32	**1900** 4096	9216 4096

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N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
241	TMC CM-5/32	University of New South Wales Kensington Australia / .	Academic	32	**1900** 4096	9216 4096
242	TMC CM-5/32	University of Tennessee Knoxville USA / .	Academic	32	**1900** 4096	9216 4096
243	NCube nCUBE2S	Rutgers University USA / .	Academic	1024	**1900** 3600	21376 3193
244	NCube nCUBE2	Sandia National Labs Albuquerque USA / .	Research	1024	**1900** 2400	21376 3193
245	KSR KSR1-64	Caltech Pasadena USA /1992	Academic	64	**1838** 2560	9216 1536
246	KSR KSR1-64	Canon Japan /1993	Industry	64	**1838** 2560	9216 1536
247	KSR KSR1-64	Canon Japan /1993	Industry	64	**1838** 2560	9216 1536
248	KSR KSR1-64	Georgia Institute of Technology USA /1993	Research	64	**1838** 2560	9216 1536
249	KSR KSR1-64	Government Communications Headquarters UK /1992	Classified	64	**1838** 2560	9216 1536
250	KSR KSR1-64	Oak Ridge National Laboratory Oak Ridge USA /1991	Research	64	**1838** 2560	9216 1536
251	KSR KSR1-64	University of Colorado USA /1992	Academic	64	**1838** 2560	9216 1536
252	KSR KSR1-64	University of Manchester Manchester UK /1994	Academic	64	**1838** 2560	9216 1536
253	KSR KSR1-64	University of Michigan Michigan USA /1993	Academic	64	**1838** 2560	9216 1536
254	KSR KSR1-64	University of Washington Seattle USA /1993	Academic	64	**1838** 2560	9216 1536
255	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1988	Vendor	1	**1817** 3000	. .
256	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1988	Vendor	1	**1817** 3000	. .
257	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1989	Vendor	1	**1817** 3000	. .
258	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1989	Vendor	1	**1817** 3000	. .
259	Hitachi S-820/80	Hitachi Ltd. GPCD Japan /1990	Vendor	1	**1817** 3000	. .
260	Hitachi S-820/80	Hitachi Ltd. SSD Japan /1989	Vendor	1	**1817** 3000	. .

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
261	Hitachi S-820/80	Hokkaido University Sapporo Japan /1989	Academic	1	**1817** 3000	. .
262	Hitachi S-820/80	Nat. Lab. for High Energy Physics Japan /1988	Research	1	**1817** 3000	. .
263	Hitachi S-820/80	Nihon University Japan /1993	Academic	1	**1817** 3000	. .
264	Hitachi S-820/80	Senshu University Japan / .	Academic	1	**1817** 3000	. .
265	IBM 9076-003 SP1	UCLA USA /1994	Academic	24	**1800** 3000	. .
266	Intel XP/A4	Caltech Pasadena USA /1993	Academic	56	**1750** 2800	6000 .
267	Intel XP/A4	George Mason University USA /1994	Academic	56	**1750** 2800	6000 .
268	Intel XP/A4	Hiroshima University Japan /1993	Academic	56	**1750** 2800	6000 .
269	Intel XP/A4	Intel SSD Development Centers Swindon UK /1994	Vendor	56	**1750** 2800	6000 .
270	Intel XP/A4	JPL USA /1994	Research	56	**1750** 2800	6000 .
271	Intel XP/A4	Rice University USA /1993	Academic	56	**1750** 2800	6000 .
272	Intel XP/A4	Sandia ATR USA /1993	Research Energy	56	**1750** 2800	6000 .
273	Intel XP/A4	Sandia National Labs Livermore USA /1993	Research Energy	56	**1750** 2800	6000 .
274	Intel XP/A4	State University of New York USA /1994	Academic	56	**1750** 2800	6000 .
275	Intel XP/A4E	Technische Universitaet Graz Graz Austria /1993	Academic	56	**1750** 2800	6000 .
276	Intel XP/A4	University of Arizona USA /1994	Academic	56	**1750** 2800	6000 .
277	Intel XP/A4	University of Indiana USA /1993	Academic	56	**1750** 2800	6000 .
278	Intel XP/A4	University of Puerto Rico USA /1994	Academic	56	**1750** 2800	6000 .
279	Intel XP/A4	University of South Carolina USA /1992	Academic	56	**1750** 2800	6000 .
280	Intel XP/A4	University of Trondheim Norway /1992	Academic	56	**1750** 2800	6000 .

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
281	Cray Y-MP M98	Cray Research Eagan USA / .	Vendor	8	**1733** 2667	. .
282	Cray Y-MP M98/82048	DOD/Defense Nuclear Agency USA /1994	Classified	8	**1733** 2667	. .
283	Cray Y-MP C94A/264	Alabama Supercomputer Center USA /1994	Academic	2	**1703** 1905	. .
284	Cray Y-MP C92A/2512	Bayer AG Germany /1994	Industry Chemistry	2	**1703** 1905	. .
285	Cray Y-MP C94/2128	CINECA Bologna Italy /1993	Academic	2	**1703** 1905	. .
286	Cray Y-MP C92A/2128	Mitsubishi Motors Company Kawasaki Japan /1993	Industry Automotive	2	**1703** 1905	. .
287	Cray Y-MP C92A/2128	Uni-C Copenhagen Denmark /1993	Academic	2	**1703** 1905	. .
288	Fujitsu VP2400/20	Computer Technology Integrated (CTI) Japan /1991	Industry	1	**1688** 2000	. .
289	Hitachi S-3600/180	Hitachi Ltd. GPCD Japan /1993	Vendor	1	**1672** 2000	. .
290	Hitachi S-3600/180	Hitachi Ltd. GPCD Japan /1993	Vendor	1	**1672** 2000	. .
291	Cray Y-MP8I/6128	NASA/Marshall Space Flight Center USA /1993	Research Aerospace	6	**1651** 2000	. .
292	Cray Y-MP8/664	Nissan Motor Kanagawa Japan /1990	Academic	6	**1651** 2000	. .
293	Cray Y-MP8I/632	Taiwan Central Weather Bureau Taiwan /1992	Research Weather	6	**1651** 2000	. .
294	Cray Y-MP8/632	Toyota Motor Company Japan /1991	Industry Automotive	6	**1651** 2000	. .
295	MasPar MP-2216	Lockheed Missiles and Space Company USA /1993	Industry Aerospace	16384	**1600** 2400	11264 1920
296	MasPar MP-2216	National Cancer Institute USA /1993	Research Chemistry	16384	**1600** 2400	11264 1920
297	DEC DECmpp SX 200	University of Bergen Bergen Norway / .	Academic	16384	**1600** 2400	11264 1920
298	Intel XP/A4E	IRISA Rennes France /1993	Research Aerospace	48	**1500** 2400	. .
299	Intel XP/A4E	University of Athen Athen Greece /1994	Academic	48	**1500** 2400	. .
300	IBM ES 9000-900	CERN Geneva Switzerland / .	Research	6	**1457** 2664	. .

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301	IBM ES 9000-900	Cornell Theory Center Ithaca USA / .	Academic	6	**1457** 2664	. .
302	IBM ES 9000-900	UCLA Los Angeles USA / .	Academic	6	**1457** 2664	. .
303	Cray CRAY-2s/4-128	Lawrence Livermore National Laboratory NERSC USA /1988	Research Energy	4	**1406** 1952	. .
304	Cray CRAY-2s/4-128	NASA/Langley Research Center Hampton USA /1989	Research	4	**1406** 1952	. .
305	Cray CRAY-2s/4-128	NCSA Urbana-Champaign USA /1988	Academic	4	**1406** 1952	. .
306	Cray CRAY-2/4-512	Arabian American Oil Company Saudi Arabia/1992	Industry Geophysics	4	**1406** 1951	. .
307	Cray CRAY-2/4-128	Cray Research Eagan USA / .	Vendor	4	**1406** 1951	. .
308	Cray CRAY-2/4-256	Defense Research Agency Farnborough UK /1990	Classified	4	**1406** 1951	. .
309	Cray CRAY-2/4-256	Direction de la Meteorologie Nationale Toulouse France /1989	Research Weather	4	**1406** 1951	. .
310	Cray CRAY-2/4-512	Minnesota Supercomputer Center USA /1988	Academic	4	**1406** 1951	. .
311	Cray CRAY-2/4-256	NTT Japan /1987	Industry Electronics	4	**1406** 1951	. .
312	Cray CRAY-2/4-512	US Air Force/National Test Facility USA /1990	Classified	4	**1406** 1951	. .
313	Cray Y-MP8I/5128	Chrysler Motors Company USA /1993	Industry Automotive	5	**1405** 1666	. .
314	Cray Y-MP8E/5128	EXXON USA /1994	Industry Geophysics	5	**1405** 1666	. .
315	Intel iPSC/860	Caltech Pasadena USA /1990	Academic	64	**1400** 2560	9000 3500
316	Intel iPSC/860	McDonnell Douglas USA /1991	Industry Aerospace	64	**1400** 2560	9000 3500
317	Intel iPSC/860	SERC USA /1990	Research	64	**1400** 2560	9000 3500
318	Intel iPSC/860	Sandia National Labs Albuquerque USA /1991	Research	64	**1400** 2560	9000 3500
319	Intel iPSC/860	Superconducting Supercollider Lab USA /1990	Research	64	**1400** 2560	9000 3500
320	Intel iPSC/860	UCSD/San Diego Supercomputer Center San Diego USA /1990	Academic	64	**1400** 2560	9000 3500

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321	Intel iPSC/860	Westinghouse Electric USA /1992	Industry Energy	64	**1400** 2560	9000 3500
322	KSR KSR1-48	North Carolina Supercomputer Center USA /1992	Academic	48	**1350** 1920	. .
323	TMC CM-2/16k	ATR Kansai Japan /1990	Research	512	**1300** 3500	. .
324	TMC CM-2/16k	GMD Birlinghoven Germany /1990	Research	512	**1300** 3500	. .
325	TMC CM-2/16k	MIT Media Lab USA /1994	Research	512	**1300** 3500	. .
326	TMC CM-2/16k	NRIC Australia /1994	Academic	512	**1300** 3500	. .
327	Meiko CS/i860/64	University of Edinburgh Edinburgh UK /1990	Academic	64	**1300** 2500	8500 3500
328	NEC SX-3/11	National Scientific Research Center (NSRC) Singapore /1994	Research	1	**1300** 1370	2816 192
329	NEC SX-3/11	Sanyo Electric Moriguchi City Japan /1991	Industry Electronics	1	**1300** 1370	2816 192
330	NEC SX-3/11	Tokai University Tokai Japan /1992	Academic	1	**1300** 1370	2816 192
331	SGI Challenge	Advanced Inst. for Science Ikoma City Japan /1993	Research	36	**1284** 2700	8000 2000
332	SGI Challenge	GFTA Duesseldorf-Erkarth Germany /1994	Industry Finance	36	**1284** 2700	8000 2000
333	SGI Challenge	GFTA Duesseldorf-Erkarth Germany /1994	Industry Finance	36	**1284** 2700	8000 2000
334	SGI Challenge	Lockheed Missles Space Res. Sunnyvale USA /1993	Research	36	**1284** 2700	8000 2000
335	SGI Challenge	Silicon Graphics Mountain View USA /1993	Vendor	36	**1284** 2700	8000 2000
336	Cray CS6400	Cray Research Eagan USA /1994	Vendor	32	**1268** 1920	5000 950
337	Cray CS6400	SICAN Hannover Germany /1994	Industry	32	**1268** 1920	5000 950
338	SGI Challenge	NCSA Urbana-Champaign USA /1994	Research	32	**1254** 2400	8000 2000
339	SGI Challenge	Silicon Graphics Houston USA /1993	Vendor	32	**1254** 2400	8000 2000
340	SGI Challenge	Silicon Graphics Hudson USA /1993	Vendor	32	**1254** 2400	8000 2000

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341	TMC CM-200/8k	KTH - Royal Institute of Technology Stockholm Sweden /1991	Academic	256	**1200** 2500	10752 4096
342	TMC CM-200/8k	Oregon State University USA /1994	Academic	256	**1200** 2500	10752 4096
343	TMC CM-200/8k	Uni-C Copenhagen Denmark /1992	Academic	256	**1200** 2500	10752 4096
344	IBM 9076-002 SP1	ESTEC Netherlands /1994	Research	16	**1200** 2000	12000 2300
345	IBM 9076-002 SP1	European Space Agency (ESTEC) Noordwijk Netherlands /1993	Research	16	**1200** 2000	12000 2300
346	IBM 9076-002 SP1	IBM Geoscience Center USA /1994	Industry Geophysics	16	**1200** 2000	12000 2300
347	IBM 9076-002 SP1	NCHC Taiwan /1994	Academic	16	**1200** 2000	12000 2300
348	IBM 9076-002 SP1	Shell KSLA Netherlands /1994	Industry Geophysics	16	**1200** 2000	12000 2300
349	IBM 9076-002 SP1	Stanford University USA /1994	Academic	16	**1200** 2000	12000 2300
350	Cray Y-MP8/4128	BMW AG Muenchen Germany /1992	Industry Automotive	4	**1159** 1333	. .
351	Cray Y-MP8E/4128	Boeing Seattle USA / .	Industry Aerospace	4	**1159** 1333	. .
352	Cray Y-MP4E/464	CSIRO (Commonwealth Scientific) Carlton Australia / .	Research	4	**1159** 1333	. .
353	Cray Y-MP4E/464	Citroen Peugeot Velizy France /1992	Industry Automotive	4	**1159** 1333	. .
354	Cray Y-MP4E/464	Compagnie Generale de Geophysique (CGG) Fletham UK /1993	Industry Geophysics	4	**1159** 1333	. .
355	Cray Y-MP4/432	Compagnie Generale de Geophysique (CGG) Massy France /1992	Industry Geophysics	4	**1159** 1333	. .
356	Cray Y-MP8/432	Defense Research Agency Ford Halstead UK /1990	Research	4	**1159** 1333	. .
357	Cray Y-MP4/432	Deutscher Wetterdienst Offenbach Germany /1990	Research Weather	4	**1159** 1333	. .
358	Cray Y-MP4/432	Du Pont De Nemours Company USA /1993	Industry Chemistry	4	**1159** 1333	. .
359	Cray Y-MP4/464	Eidgenoessische Technische Hochschule Zuerich Switzerland /1992	Academic	4	**1159** 1333	. .
360	Cray Y-MP8/464	Fiat Torino Italy /1993	Industry Automotive	4	**1159** 1333	. .

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N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
361	Cray Y-MP4/432	Florida State University Tallahassee USA /1990	Academic	4	**1159** 1333	. .
362	Cray Y-MP4/464	Grumman Johnson Space Center USA /1993	Research Aerospace	4	**1159** 1333	. .
363	Cray Y-MP4E/464	Hyundai Korea /1993	Industry Automotive	4	**1159** 1333	. .
364	Cray Y-MP4E/464	Lockheed Aeronautical Systems Company USA /1992	Industry Aerospace	4	**1159** 1333	. .
365	Cray Y-MP8I/4128	Lockheed Aeronautical Systems Company USA /1993	Industry Aerospace	4	**1159** 1333	. .
366	Cray Y-MP4E/464	MPI Garching Germany /1991	Research	4	**1159** 1333	. .
367	Cray Y-MP4E/464	Matsushita Electric Osaka Japan /1992	Academic	4	**1159** 1333	. .
368	Cray Y-MP8I/4128	Merck Co USA /1993	Industry Chemistry	4	**1159** 1333	. .
369	Cray Y-MP4/464	Mitsubishi Motors Company Okazaki Japan /1992	Industry Automotive	4	**1159** 1333	. .
370	Cray Y-MP4/464	NCSA Urbana-Champaign USA /1990	Academic	4	**1159** 1333	. .
371	Cray Y-MP8/464	North Carolina Supercomputer Center USA /1991	Academic	4	**1159** 1333	. .
372	Cray Y-MP8/4128	ONERA Chatillon France /1991	Research Aerospace	4	**1159** 1333	. .
373	Cray Y-MP4E/464	Renault Rueil-Malmaison France /1994	Industry Automotive	4	**1159** 1333	. .
374	Cray Y-MP4E/464	Samsung Korea /1991	Industry Electronics	4	**1159** 1333	. .
375	Cray Y-MP8/464	Swedish National Supercomputer Centre Linkoping Sweden /1993	Academic	4	**1159** 1333	. .
376	Cray Y-MP8/4128	Toshiba Kanagawa Japan /1990	Academic	4	**1159** 1333	. .
377	Cray Y-MP4/464	Universidad Nacional Autonoma de Mexico Mexico /1994	Academic	4	**1159** 1333	. .
378	Cray Y-MP4E/464	Universitaet Kaiserslautern Kaiserslautern Germany /1993	Academic	4	**1159** 1333	. .
379	Cray Y-MP4/464	University of Trondheim Norway /1992	Academic	4	**1159** 1333	. .
380	Cray Y-MP8/464	VW (Volkswagen AG) Wolfsburg Germany /1993	Industry Automotive	4	**1159** 1333	. .

TOP500 Supercomputers - Worldwide

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
381	SGI Challenge	Silicon Graphics Mountain View USA /1993	Vendor	28	**1153** 2100	8000 2000
382	SGI Challenge	Silicon Graphics Mountain View USA /1994	Vendor	28	**1153** 2100	8000 2000
383	Cray Y-MP M94/4512	Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1993	Academic	4	**1114** 1333	. .
384	Cray Y-MP M94/4256	KFA Juelich Germany /1993	Research	4	**1114** 1333	. .
385	Cray Y-MP M98/41024	University of Alaska Fairbanks USA /1992	Academic	4	**1114** 1333	. .
386	IBM 9076-002 SP1	CSC-HUT Finland /1994	Academic	14	**1050** 1750	. .
387	Fujitsu VPX220/10	GECO-PRAKLA Houston USA /1993	Industry Geophysics	1	**1048** 1250	. .
388	Fujitsu VPX220/10	Institute of Space Astronautical Science (ISAS) Tokyo Japan /1993	Research	1	**1048** 1250	. .
389	Fujitsu VPX220/10	Keio Daigaku University Japan /1992	Academic	1	**1048** 1250	. .
390	SNI S200/10	Schering Berlin Germany /1991	Industry Chemistry	1	**1048** 1250	. .
391	SNI S200/20	Siemens Muenchen Germany /1991	Industry Electronics	1	**1048** 1250	. .
392	SGI Challenge	Silicon Graphics Cortaillod Switzerland /1993	Vendor	24	**1014** 1800	8000 1000
393	Parsytec GC PowerPlus/32	ZIAM (Center for Industrial Appl. of MPPs) Herzogenrath Germany /1994	Industry	32	**1007** 2560	9216 .
394	TMC CM-5/16	Aizu Univerity Japan /1994	Academic	16	**980** 2048	6528 3008
395	TMC CM-5/16	Goverment USA /1993	Classified	16	**980** 2048	6528 3008
396	TMC CM-5/16	Kyushu University Kyushu Japan / .	Academic	16	**980** 2048	6528 3008
397	TMC CM-5/16	Lorenzian USA /1993		16	**980** 2048	6528 3008
398	TMC CM-5/16	NCSA USA /1993	Academic	16	**980** 2048	6528 3008
399	TMC CM-5/16	Pittsburgh Supercomputing Center Pittsburgh USA / .	Academic	16	**980** 2048	6528 3008
400	TMC CM-5/16	RUG (Rijksuniversiteit Groningen) Groningen Netherlands /1993	Academic	16	**980** 2048	6528 3008

TOP500 Supercomputers - Worldwide

N local world	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
401	TMC CM-5/16	Thinking Machines USA /1993	Vendor	16	**980** 2048	6528 3008
402	TMC CM-5/16	West Virginia University USA / .	Academic	16	**980** 2048	6528 3008
403	TMC CM-2/12k	ICFD Japan /1991	Research	384	**975** 2625	. .
404	Parsytec GCel 3/1024	Universitaet Koeln/DLR Koeln Germany /1992	Academic	1024	**971** 1540	15999 2073
405	Parsytec GCel 3/1024	Universitaet Paderborn Paderborn Germany /1992	Academic	1024	**971** 1540	15999 2073
406	Meiko CS/i860/42	Ensign Geophysics Weybridge UK /1987	Academic	42	**970** 1700	. .
407	NCube nCUBE2	Earth Resource Lab MIT Cambridge USA /1992	Research Geophysics	512	**958** 1200	15200 2240
408	NCube nCUBE2	Mitsubishi Electric Corporation Kanagawa Japan /1991	Industry Electronics	512	**958** 1200	15200 2240
409	NCube nCUBE2	Rockwell USA /1992	Industry Aerospace	512	**958** 1200	15200 2240
410	Convex SPP1000/XA	Josef Stefan Institut Ljubljana Slovenia /1994	Research	8	**947** 1600	11000 650
411	Convex SPP1000/XA	NASA/Goddard Space Flight Center Greenbelt USA /1994	Research Aerospace	8	**947** 1600	11000 650
412	Convex SPP1000/XA	NCSA Urbana-Champaign USA /1994	Academic	8	**947** 1600	11000 650
413	Convex SPP1000/XA	NKK Japan /1994	Industry	8	**947** 1600	11000 650
414	Convex SPP1000/XA	Universitaet Erlangen Erlangen Germany /1994	Academic	8	**947** 1600	11000 650
415	Convex SPP1000/XA	Universite Catholique Louvaun-la-Neuve Belgium /1994	Academic	8	**947** 1600	11000 650
416	Hitachi S-820/60	Defence Agency Land Japan /1989	Classified	1	**905** 1500	. .
417	Hitachi S-820/60	Hitachi Ltd. Adv. Res. Lab Japan /1993	Vendor	1	**905** 1500	. .
418	Hitachi S-820/60	Hitachi Ltd. Cent. Res. Lab. Japan /1992	Vendor	1	**905** 1500	. .
419	Hitachi S-820/60	Hitachi Ltd. SICD Japan /1991	Vendor	1	**905** 1500	. .
420	Hitachi S-820/60	Hitachi Ltd. SICD Japan /1991	Vendor	1	**905** 1500	. .

TOP500 **Supercomputers - Worldwide**

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
421	Hitachi S-820/60	Hitachi Ltd. STRD Japan /1991	Vendor	1	**905** 1500	. .
422	Hitachi S-820/60	Kajima Corporation Japan /1990	Industry Construction	1	**905** 1500	. .
423	Hitachi S-820/60	Suzuki Motor Japan /1989	Industry Automotive	1	**905** 1500	. .
424	Hitachi S-820/60	Yamaichi Information Systems Japan /1989	Research Economics	1	**905** 1500	. .
425	Cray Y-MP C92A/132	Kawasaki Motor Japan /1993	Industry Automotive	1	**902** 952	. .
426	KSR KSR1-32	AWI (Alfred Wegener Institut) Bremerhaven Germany /1994	Research	32	**893** 1280	6144 896
427	KSR KSR1-32	American Airlines USA /1994	Industry Aerospace	32	**893** 1280	6144 896
428	KSR KSR1-32	GWDG Goettingen Germany /1992	Academic	32	**893** 1280	6144 896
429	KSR KSR1-32	Leibniz Rechenzentrum Muenchen Germany /1993	Academic	32	**893** 1280	6144 896
430	KSR KSR1-32	Universitaet Mannheim Mannheim Germany /1992	Academic	32	**893** 1280	6144 896
431	KSR KSR1-32	University of Houston USA /1992	Academic	32	**893** 1280	6144 896
432	KSR KSR1-32	University of Toronto Toronto Canada /1993	Academic	32	**893** 1280	6144 896
433	NEC SX-2	Aoyama Gakuin University Japan /1988	Academic	1	**885** 1333	. .
434	NEC SX-2	Institute Laser Eng Osaka Univ. Osaka Japan /1985	Academic	1	**885** 1333	. .
435	NEC SX-2	Institute of Computational Fluid Dynamics Japan /1987	Research	1	**885** 1333	. .
436	NEC SX-2A	Mazda Motor Corporation Yokohama Japan /1989	Industry Automotive	1	**885** 1333	. .
437	NEC SX-2	NEC Fuchu Plant Japan /1987	Vendor	1	**885** 1333	. .
438	NEC SX-2	NEC Scientific Information (NSIS) Japan /1985	Research	1	**885** 1333	. .
439	NEC SX-2	Sumitomo Metal Industries Japan /1988	Industry	1	**885** 1333	. .
440	Cray Y-MP4/332	Arco Oil and Gas Company USA /1992	Industry Geophysics	3	**881** 999	. .

TOP500 **Supercomputers - Worldwide**

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
441	Cray Y-MP4E/364	British Aerospace PLC Farnborough UK /1991	Industry Aerospace	3	**881** 999	. .
442	Cray Y-MP4E/332	Bureau of Meterology Melbourne Australia /1993	Research Weather	3	**881** 999	. .
443	Cray Y-MP4E/364	DKRZ Hamburg Germany /1991	Research Weather	3	**881** 999	. .
444	Cray Y-MP8/364	Honda Research and Development Company Tokyo Japan /1990	Industry Automotive	3	**881** 999	. .
445	Cray Y-MP4/364	Mitsubishi Electric Corporation Kanagawa Japan /1991	Industry Electronics	3	**881** 999	. .
446	Cray Y-MP4E/332	Mobil / Technical Center Tulsa USA /1993	Industry Geophysics	3	**881** 999	. .
447	Cray Y-MP4/364	Rolls-Royce PLC UK /1994	Industry Aerospace	3	**881** 999	. .
448	Cray Y-MP4/332	Shell USA USA /1992	Industry Geophysics	3	**881** 999	. .
449	Intel XP/A2	Intel SSD Development Centers USA /1993	Vendor	28	**870** 1400	. .
450	Intel XP/A2	Texas AM University USA /1994	Academic	28	**870** 1400	. .
451	Intel XP/A2	UCSD/San Diego Supercomputer Center San Diego USA /1994	Academic	28	**870** 1400	. .
452	Intel XP/A2	University of Illinois USA /1994	Academic	28	**870** 1400	. .
453	Intel XP/A2	Virginia Poly Tech USA /1994	Research	28	**870** 1400	. .
454	SGI Challenge	BMW Munich Germany /1994	Industry Automotive	20	**866** 1500	7000 1000
455	SGI Challenge	Missle Space Intelligence Center Huntsville USA /1993	Classified	20	**866** 1500	7000 1000
456	SGI Challenge	SAIC Arlington USA /1993	Classified	20	**866** 1500	7000 1000
457	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
458	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
459	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
460	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000

TOP500 Supercomputers - Worldwide

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
461	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
462	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
463	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
464	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
465	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
466	SGI Challenge	Silicon Graphics Houston USA /1994	Vendor	20	**866** 1500	7000 1000
467	SGI Onyx	University of Minnesota Minneapolis USA /1994	Academic	20	**866** 1500	7000 1000
468	Cray Y-MP M98/31024	General Motors/Research Environment Staff USA /1993	Industry Automotive	3	**855** 999	. .
469	Hitachi S-3600/160	Hitachi Zosen Corp. Japan /1992	Vendor	1	**851** 1000	. .
470	Hitachi S-3600/160	Toyo Tire Rubber Japan /1993	Industry	1	**851** 1000	. .
471	Fujitsu VP2200/10	ANSTO Australia /1991	Academic	1	**842** 1000	. .
472	Fujitsu VP2200/10	Australian National University Canberra Australia /1991	Academic	1	**842** 1000	. .
473	Fujitsu VP2200/20	GECO-PRAKLA London/Gatwick UK /1993	Industry Geophysics	1	**842** 1000	. .
474	Fujitsu VP2200/20	GECO-PRAKLA Orpington UK /1993	Industry Geophysics	1	**842** 1000	. .
475	Fujitsu VP2200/10	Kawasaki Heavy Industry Japan /1990	Industry Heavy Ind.	1	**842** 1000	. .
476	Fujitsu VP2200/10	Kawasaki Steel Japan /1991	Industry Heavy Ind.	1	**842** 1000	. .
477	Fujitsu VP2200/10	Meiji University Japan /1990	Academic	1	**842** 1000	. .
478	Fujitsu VP2200/10	Nikko Securities Japan /1991	Industry finance	1	**842** 1000	. .
479	Fujitsu VP2200/10	Nippon Steel Japan /1992	Industry Heavy Ind.	1	**842** 1000	. .
480	Fujitsu VP2200/10	Sharp Japan /1990	Industry Electronics	1	**842** 1000	. .

TOP500 **Supercomputers - Worldwide**

N *local* *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**Rmax** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
481	Fujitsu VP2200/10	Sony Japan /1990	Industry	1	**842** 1000	. .
482	Fujitsu VP2200/20	Toyota Motor Company Japan /1991	Industry Automotive	1	**842** 1000	. .
483	SNI S200/10 (4ns)	Universitaet Frankfurt Frankfurt Germany /1991	Academic	1	**842** 1000	. .
484	Meiko CS/i860/32	DRA Malvern Weybridge UK /1990	Research	32	**825** 1300	7000 3000
485	Cray X-MP/416	AMK Bonn Germany /1990	Classified	4	**822** 940	. .
486	Cray X-MP EA/432	BP Exploration Inc./U.S. USA /1990	Industry Geophysics	4	**822** 940	. .
487	Cray X-MP/48	Battelle Software Seattle USA / .	Industry Energy	4	**822** 940	. .
488	Cray X-MP/48	British Petroleum London UK / .	Industry Geophysics	4	**822** 940	. .
489	Cray X-MP/416	CEA (Commissariat a l'Energie Atomique) Limeil France /1987	Research	4	**822** 940	. .
490	Cray X-MP/416	CISI-Framatome La Defense France /1990	Research	4	**822** 940	. .
491	Cray X-MP/4	Chevron La Habra USA / .	Industry Geophysics	4	**822** 940	. .
492	Cray X-MP/416	Compagnie Generale de Geophysique (CGG) Massy France /1992	Industry Geophysics	4	**822** 940	. .
493	Cray X-MP EA/464	Finish State Computer Centre Espoo Finland /1990	Academic	4	**822** 940	. .
494	Cray X-MP/416	Lawrence Livermore National Laboratory Livermore USA /1987	Research	4	**822** 940	. .
495	Cray X-MP EA/464	Lockheed Missiles and Space Company USA /1990	Industry Aerospace	4	**822** 940	. .
496	Cray X-MP/416	Los Alamos National Laboratory Los Alamos USA /1994	Research Energy	4	**822** 940	. .
497	Cray X-MP EA/464	MIT Cambridge USA / .	Research	4	**822** 940	. .
498	Cray X-MP/416	Michelin Clermont-Ferrand France /1992	Industry Automotive	4	**822** 940	. .
499	Cray X-MP EA/464	Minnesota Supercomputer Center USA /1992	Academic	4	**822** 940	. .
500	Cray X-MP/416	NASA/Marshall Space Flight Center USA /1988	Research Aerospace	4	**822** 940	. .

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	86	53	13	9	161
TMC	51	13	11	4	79
Intel	55	13	4	1	73
Fujitsu	3	4	27	2	36
Hitachi			28		28
NEC	2	3	21	2	28
KSR	16	8	2		26
SGI	20	4	1		25
IBM	9	5		1	15
SNI		9			9
Convex	2	3	1		6
NCube	4		1		5
Meiko		3			3
Parsytec		3			3
MasPar	2				2
DEC		1			1
Total	250	122	109	19	500

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

TOP500 Statistics — Installed R_{max} [Gflop/s]					
	USA	Europe	Japan	others	Total
Cray	402.0	171.8	39.1	24.4	637.3
TMC	376.1	31.2	29.0	7.0	443.3
Intel	322.1	29.8	20.0	1.9	373.7
Fujitsu	5.3	5.9	291.5	1.7	304.4
Hitachi			122.5		122.5
NEC	25.0	28.2	129.0	4.2	186.4
KSR	38.6	15.7	3.7		57.9
SGI	19.9	4.4	1.3		25.6
IBM	25.4	6.1		1.2	32.7
SNI		25.1			25.1
Convex	1.9	2.8	0.9		5.7
NCube	5.7		1.0		6.7
Meiko		3.1			3.1
Parsytec		2.9			2.9
MasPar	3.2				3.2
DEC		1.6			1.6
Total	1225.1	328.6	637.9	40.4	2232.0

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

TOP500 Statistics — Installed R_{peak} [Gflop/s]					
	USA	Europe	Japan	others	Total
Cray	514.3	224.5	51.7	28.2	818.7
TMC	825.3	68.1	68.1	15.8	977.3
Intel	487.3	50.2	33.4	3.1	574.0
Fujitsu	6.3	7.0	466.7	2.0	481.9
Hitachi			153.5		153.5
NEC	27.5	31.5	146.2	4.6	209.7
KSR	60.8	21.9	5.1		87.8
SGI	36.3	8.7	2.7		47.7
IBM	48.8	10.4		2.0	61.2
SNI		32.4			32.4
Convex	3.2	4.8	1.6		9.6
NCube	8.4		1.2		9.6
Meiko		5.5			5.5
Parsytec		5.6			5.6
MasPar	4.8				4.8
DEC		2.4			2.4
Total	2022.9	473.2	930.2	55.6	3481.9

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