CS - 89 - 85

Performance of Various Computers Using Standard Linear Equations Software

Jack J. Dongarra*

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

Computer Science and Mathematics Division
Oak Ridge National Laboratory
Oak Ridge, TN 37831

University of Manchester

CS - 89 - 85

June 15, 2014

* Electronic mail address: dongarra@eecs.utk.edu.
An up-to-date version of this report can be found at http://www.netlib.org/benchmark/performance.ps
This work was supported in part by the Applied Mathematical Sciences subprogram of the Office of Energy Research, U.S. Department of Energy, under Contract DE-AC05-96OR22464, and in part by the Science Alliance a state supported program at the University of Tennessee.

Performance of Various Computers Using Standard Linear Equations Software

Jack J. Dongarra
Electrical Engineering and Computer Science Department
University of Tennessee
Knoxville, TN 37996-1301

Computer Science and Mathematics Division
Oak Ridge National Laboratory
Oak Ridge, TN 37831

University of Manchester

June 15, 2014

Abstract

This report compares the performance of different computer systems in solving dense systems of linear equations. The comparison involves approximately a hundred computers, ranging from the Earth Simulator to personal computers.

1. Introduction and Objectives

The timing information presented here should in no way be used to judge the overall performance of a computer system. The results reflect only one problem area: solving dense systems of equations.

This report provides performance information on a wide assortment of computers ranging from the home-used PC up to the most powerful supercomputers. The information has been collected over a period of time and will undergo change as new machines are added and as hardware and software systems improve. The programs used to generate this data can easily be obtained over the Internet. 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 encourage users to obtain the programs and run the routines on their machines, reporting any discrepancies with the numbers listed here.

The first table reports three numbers for each machine listed (in some cases the numbers are missing because of lack of data). All performance numbers reflect an accuracy of full precision (usually 64-bit), unless noted. On some machines full precision may be single precision, such as the Cray, or double precision, such as the IBM. The first number is for the LINPACK [1] benchmark program for a matrix of order 100 in a Fortran environment. The second number is for solving a system of equations of order 1000, with no restriction on the method or its implementation. The third number is the theoretical peak performance of the machine.

LINPACK programs can be characterized as having a high percentage of floating-point arithmetic operations. The routines involved in this timing study, SGEFA and SGESL, use column-oriented algorithms. That is, the programs usually reference array elements sequentially down a column, not across a row. Column orientation is important in increasing efficiency because of the way Fortran stores arrays. Most floating-point operations in LINPACK take place in a set of subprograms, the Basic Linear Algebra Subprograms (BLAS) [3], which are called repeatedly throughout the calculation. These BLAS, referred to now as Level 1 BLAS, reference one-dimensional arrays, rather than two-dimensional arrays.

In the first case, the problem size is relatively small (order 100), and no changes were made to the LINPACK software. Moreover, no attempt was made to use special hardware features or to exploit vector capabilities or multiple processors. (The compilers on some machines may, of course, generate optimized code that itself accesses special features.) Thus, many high-performance machines may not have reached their asymptotic execution rates.

In the second case, the problem size is larger (matrix of order 1000), and modifying or replacing the algorithm and software was permitted to achieve as high an execution rate as possible. Thus, the hardware had more opportunity for reaching near-asymptotic rates. An important constraint, however, was that all optimized programs maintain the same relative accuracy as standard techniques, such as Gaussian elimination used in LINPACK.

Furthermore, the driver program (supplied with the LINPACK benchmark) had to be run to ensure that the same problem is solved. The driver program sets up the matrix, calls the routines to solve the problem, verifies that the answers are correct, and computes the total number of operations to solve the problem (independent of the method) as $2n^3/3+2n^2$, where $n=1000$.

The last column is based not on an actual program run, but on a paper computation to determine the theoretical peak Mflop/s rate for the machine. This is the number manufacturers often cite; it represents an upper bound on performance. That is, the manufacturer guarantees that programs will not exceed this rate—sort of a "speed of light" for a given computer.

The theoretical peak performance is determined by counting the number of floating-point additions and multiplications (in full precision) that can be completed during a period of time, usually the cycle time of the machine. As an example, the Cray Y-MP/8 has a cycle time of 6 ns. During a cycle the results of both an addition and a multiplication can be completed $\frac{2\text{ operations}}{1\text{ cycle}} * \frac{1\text{ cycle}}{6\text{ ns}} = 333\text{ Mflop/s}$ on a single processor. On the Cray Y-MP/8 there are 8 processors; thus, the peak performance is 2667 Mflop/s.

The information in this report is presented to users to provide a range of performance for the various computers and to show the effects of typical Fortran programming and the results that can be obtained through careful programming. The maximum rate of execution is given for comparison. The column labeled "Computer" gives the name of the computer hardware on which the program was run. In some cases we have indicated the number of processors in the configuration and, in some cases, the cycle time of the processor in nanoseconds.

The column labeled "LINPACK Benchmark" gives the operating system and compiler used. The run was based on two routines from LINPACK: SGEFA and SGESL were used for single precision, and DGEFA and DGESL were used for double precision. These routines perform standard LU decomposition with partial pivoting and backsubstitution. The timing was done on a matrix of order 100, where no changes are allowed to the Fortran programs.

The column labeled "TPP" (Toward Peak Performance) gives the results of hand optimization; the problem size was of order 1000.

The final column labeled "Theoretical Peak" gives the maximum rate of execution based on the cycle time of the hardware.

The same matrix was used to solve the system of equations. The results were checked

for accuracy by calculating a residual for the problem $\| Ax-b \| /(\| A \| \| x \|)$. The residual must be less than $n\varepsilon$ where n is the order of the matrix and ε is the machine precision, on IEEE computers this is 2^{-53}.
The term Mflop/s, used as a rate of execution, stands for millions of floating-point operations completed per second. For solving a system of n equations, $2/3n^3+2n^2$ operations are performed (we count both additions and multiplications).
The information in the tables was compiled over a period of time. Subsequent systems software and hardware changes may alter the timings to some extent.
One further note: The following tables should not be taken too seriously. In multiprogramming environments it is often difficult to reliably measure the execution time of a single program. We trust that anyone actually evaluating machines and operating systems will gather more reliable and more representative data.

2. A Look at Parallel Processing

While collecting the data presented in Table 1, we were able to experiment with parallel processing on a number of computer systems. For these experiments, we used either the standard LINPACK algorithm or an algorithm based on matrix-matrix [2] techniques. In the case of the LINPACK algorithm, the loop around the SAXPY can be performed in parallel. In the matrix-matrix implementation the matrix product can be split into submatrices and performed in parallel. In either case, the parallelism follows a simple fork-and-join model where each processor gets some number of operations to perform.
For a problem of size 1000, we expect a high degree of parallelism. Thus, it is not surprising that we get such high efficiency (see Table 2). The actual percentage of parallelism, of course, depends on the algorithm and on the speed of the uniprocessor on the parallel part relative to the speed of the uniprocessor on the non-parallel part.

3. Highly Parallel Computing

With the arrival of massively parallel computers there is a need to benchmark such machines on problems that make sense. The problem size and rule for the runs reflected in the Tables 1 and 2 do not permit massively parallel computers to demonstrate their potential performance. The basic flaw is the problem size is too small. To provide a forum for comparing such machines the following benchmark was run on a number of massively parallel machines. The benchmark involves solving a system of linear equations (as was done in Tables 1 and 2). However in this case, the problem size is allowed to increase and the performance numbers reflect the largest problem run on the machine.
The ground rules are as follows: Solve systems of linear equations by some method, allow the size of the problem to vary, and measure the execution time for each size problem. In computing the floating-point execution rate, use $2n^3/3+2n^2$ operations independent of the actual method used. (If you choose to do Gaussian Elimination, partial pivoting must be used.) Compute and report a residual for the accuracy of solution as $\| Ax-b \| /(\| A \| \| x \|)$. The residual must be less than $n\varepsilon$ where n is the order of the matrix and ε is the machine precision, on IEEE computers this is 2^{-53}.

The columns in Table 3 are defined as follows:

R_{max} the performance in Gflop/s for the largest problem run on a machine.

N_{max} the size of the largest problem run on a machine.

$N_{1/2}$ the size where half the R_{max} execution rate is achieved.

R_{peak} the theoretical peak performance in Gflop/s for the machine.

In addition, the number of processors and the cycle time is listed.

4. Obtaining the Software and Running the Benchmarks

The software used to generate the data for this report can be obtained by sending electronic mail to *netlib@ornl.gov*.

1. LINPACK Benchmark

The first results listed in Table 1 involved no hand optimization of the LINPACK benchmark.
To receive the single-precision software for this benchmark, in the mail message to *netlib@ornl.gov* type:
send linpacks from benchmark .
To receive the double-precision software for the LINPACK Benchmark, type:
send linpackd from benchmark .
To run the timing programs, one must supply a real function SECOND which returns the time in seconds from some fixed starting time.
There is only one ground rule for running this benchmark:

- No changes are to be made to the Fortran source code, not even changes in the comments.

The compiler and operating system must be generally available. Results from a beta version of a compiler are allowed, however the standard compiler results must also be listed.

2. Toward Peak Performance

The second set of results listed in Table 1 reflected user optimization of the software.
To receive the single-precision software for the column labeled “Toward Peak Performance,” in the mail message *netlib@ornl.gov* type:
send 1000s from benchmark
To receive the double-precision software, type:
send 1000d from benchmark
The ground rules for running this benchmark are as follows:

- Replacements or modifications are allowed in the routine LU.
- The user is allowed to supply any method for the solution of the system of equations.
- The Mflop/s rate will be computed based on the operation count for LU decomposition.
- In all cases, the main driver routine, with its test matrix generator and residual check, must be used.

This report is updated from time to time. A fax copy of this report can be supplied, for details contact the author. To obtain a Postscript copy of the report send mail to *netlib@ornl.gov* and in the message type:
send performance from benchmark.
To have results verified, please send the output of the runs to

Jack Dongarra

Computer Science Department
University of Tennessee
Knoxville, TN 37996-1301
Email: dongarra@cs.utk.edu

There is a “Frequently Asked Questions" file for the Linpack benchmark and Top500 at http://www.netlib.org/utk/people/JackDongarra/faq-linpack.html.

Table 1: **Performance in Solving a System of Linear Equations**

Computer	**“LINPACK Benchmark” OS/Compiler**	**n=100 Mflop/s**	**“TPP” Best Effort n=1000 Mflop/s**	**“Theoritical Peak” Mflop/s**
Intel Pentium Woodcrest (1 core, 3 GHz)	ifort -parallel -xT -O3 -ipo -mP2OPT_hlo_loop_unroll_factor=2	3018	6542	12000
Intel Pentium Woodcrest (1 core, 2.67 GHz)	ifort -O3 -ipo -xT -r8 -i8	2636		10680
Intel Core 2 Q6600 Kensfield) (4 core, 2.4 GHz)			13130	38400
Intel Core 2 Q6600 Kensfield) (3 core, 2.4 GHz)			11980	28800
Intel Core 2 Q6600 Kensfield) (2 core, 2.4 GHz)			9669	19200
Intel Core 2 Q6600 Kensfield) (1 core, 2.4 GHz)	ifort -O3 -xT -ipo -static -i8 -mP2OPT_hlo_loop_unroll_factor=2	2426	7519	9600
NEC SX-8/8 (8proc. 2 GHz)			75140	128000
NEC SX-8/4 (4proc. 2 GHz)			43690	64000
NEC SX-8/2 (2proc. 2 GHz)			25060	32000
NEC SX-8/1 (1proc. 2 GHz)	-pi -Wf"-prob_use"	2177	14960	16000
HCL Infiniti Global Line 4700 HW (4 proc Intel Xeon 3.16 GHz)	ifort -fast -r8 -align	1892	9917	25280
HP ProLiant BL20p G3 (2 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)			8185	14800
HP ProLiant BL20p G3 (1 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1852	4851	7400
HP ProLiant DL360 G4 (2 proc, 3.6GHz/1MB Xeon)			7031	14400
HP ProLiant DL360 G4 (1 proc, 3.6GHz/1MB Xeon)	Intel 8.1 -fpp -xW -O2 -unroll -align -openmp	1821	4220	7200
HP ProLiant DL360 G4p (2 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)			8155	14800
HP ProLiant DL360 G4p (1 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1861	4860	7400
HP ProLiant DL140 G2 (2 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)			8163	14800
HP ProLiant DL140 G2 (1 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1861	4858	7400
HP ProLiant ML370 G4 (2 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)			8111	14800
HP ProLiant ML370 G4 (1 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1851	4835	7400
HP ProLiant DL380 G4 (2 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)			8198	14800
HP ProLiant DL380 G4 (1 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1851	4882	7400
Intel Pentium Nocona 3.6 GHz	ifort -O3 -xP -ipo -align -r8	1803	3385	7200
Intel xeon 64 (dual) 3.6 GHz	ifort -fast -r8 -align.	1779	7278	14400
IBM eServer p5 575 (8 proc, 1.9 GHz POWER5)			34570	60800
IBM eServer p5 575 (1 proc, 1.9 GHz POWER5)	-O3 -qarch=pwr5 -qtune=pwr5 -Pv -Wp,-ea478,-g1	1776	5872	7600

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
SGI Altix 3700 Bx2 Itanium 2 (1 proc 1.6 GHz)	-ipo -O3 -mP2OPT_hlo_loadpair=F -mP2OPT_hlo_prefetch=F -mP2OPT_hlo_loop_unroll_factor=2 -mP3OPT_ecg_mm_fp_ld_latency=8	1765	5953	6400
HP Integrity rx2620-2 (2 proc, 1.6GHz/3MB Itanium 2)			10210	12800
HP Integrity rx2620-2 (1 proc, 1.6GHz/3MB Itanium 2)	HP-UX, f90 +Ofaster +Oloop_unroll=2 +Onodataprefetch	1761	5603	6400
HP Integrity rx1620-2 (2 proc, 1.6GHz/3MB Itanium 2)			10320	12800
HP Integrity rx1620-2 (1 proc, 1.6GHz/3MB Itanium 2)	HP-UX, f90 +Ofaster +Oloop_unroll=2 +Onodataprefetch	1761	5655	6400
HP ProLiant DL140 G2 (2 proc (1 cpu core per single chip), 3.6GHz Intel Xeon)			7870	14400
HP ProLiant DL140 G2 (1 proc (1 cpu core per single chip), 3.6GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1756	4620	7200
HP Integrity rx4640-8 (4 proc, 1.6GHz/9MB Itanium 2)			19470	25600
HP Integrity rx4640-8 (2 proc, 1.6GHz/9MB Itanium 2)			10940	12800
HP Integrity rx4640-8 (1 proc, 1.6GHz/9MB Itanium 2)	HP-UX, f90 +Ofaster +Oloop_unroll=2 +Onodataprefetch	1756	5959	6400
HP ProLiant ML350 G4p (2 proc (1 cpu core per single chip), 3.6GHz Intel Xeon)			7876	14400
HP ProLiant ML350 G4p (1 proc (1 cpu core per single chip), 3.6GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1754	4646	7200
HP ProLiant BL20p G3 (2 proc (1 cpu core per single chip), 3.6GHz Intel Xeon)			7851	14400
HP ProLiant BL20p G3 (1 proc (1 cpu core per single chip), 3.6GHz Intel Xeon)	SuSE SLES 9 / Intel 8.1 Compile flags: -fpp -xP -O3 -openmp -align -ipo	1754	4638	7200
HP ProLiant BL45p (4 proc (1 cpu core per single chip), 2.8GHz AMD 854 Opteron)			12860	22400
HP ProLiant BL45p (2 proc (1 cpu core per single chip), 2.8GHz AMD 854 Opteron)			7678	11200
HP ProLiant BL45p (1 proc (1 cpu core per single chip), 2.8GHz AMD 854 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64	1717	4191	5600
HP ProLiant BL25p (2 proc (1 cpu core per single chip), 2.8GHz AMD 254 Opteron)			7683	11200
HP ProLiant BL25p (1 proc (1 cpu core per single chip), 2.8GHz AMD 254 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64	1717	4199	5600
HP ProLiant DL385 (2 proc (1 cpu core per single chip), 2.8GHz AMD 254 Opteron)			7661	11200
HP ProLiant DL140 G2 (2 proc (1 cpu core per single chip), 3.8GHz Intel Xeon)			8163	14800
HP ProLiant DL585 (4 proc (1 cpu core per single chip), 2.8GHz AMD 854 Opteron)			12910	22400
HP ProLiant DL585 (2 proc (1 cpu core per single chip), 2.8GHz AMD 854 Opteron)			7619	11200

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
HP ProLiant DL585 (1 proc (1 cpu core per single chip), 2.8GHz AMD 854 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64 -mp	1712	4166	5600
HP ProLiant DL385 (1 proc (1 cpu core per single chip), 2.8GHz AMD 254 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64 -mp	1712	4238	5600
HP ProLiant BL30p (2 proc. 3.20 GHz, Xeon)			6264	12800
HP ProLiant BL30p (1 proc. 3.20 GHz, Xeon)	ifort -xW -O3 -parallel -ipo	1704	3522	6400
IBM eServer BladeCenter JS20 (2 proc, 2.2 GHz PowerPC 970)			5817	17600
IBM eServer BladeCenter JS20 (1 proc, 2.2 GHz PowerPC 970)	-O4 -qarch=auto -qtune=auto	1681	3840	8800
Fujitsu Siemens hpcLine (2 proc Intel Xeon 3.2 GHz)			5151	12800
Fujitsu Siemens hpcLine (1 proc Intel Xeon 3.2 GHz)	ifort -O3 -xN -ipo -align -r8	1679	3148	6400
SGI Altix 3000 (1.5 GHz Itanium 2)	-O3 -mP2OPT_hlo_loadpair=F -mP2OPT_hlo_prefetch=F -mP2OPT_hlo_loop_unroll_factor=2 -mP3OPT_ecg_mm_fp_ld_latency=8 -ipo -fno-alias	1659	5400	6000
HP Integrity Server rx2600 (2 proc 1.5GHz)			10240	12000
HP Integrity Server rx2600 (1 proc 1.5GHz)	f90 +DSitanium2 +O3 +Oinline_budget=100000 +Ono_ptrs_to_globals +Oloop_unroll=2 +Onodataprefetch	1635	5431	6000
HP Integrity Server rx5670 (4 proc 1.5GHz)			18180	24000
HP Integrity Server rx5670 (2 proc 1.5GHz)			10030	12000
HP Integrity Server rx5670 (1 proc 1.5GHz)	f90 +DSitanium2 +O3 +Oinline_budget=100000 +Ono_ptrs_to_globals +Oloop_unroll=2 +Onodataprefetch	1631	5423	6000
HP ProLiant BL45p (4 proc (1 cpu core per single chip), 2.6GHz 852 Opteron)			12030	20800
HP ProLiant BL45p (2 proc (1 cpu core per single chip), 2.6GHz 852 Opteron)			7023	10400
HP ProLiant BL45p (1 proc (1 cpu core per single chip), 2.6GHz 852 Opteron)	PGI 5.2-4 -fastsse -tp k8-64 -mp	1593	3894	5200
HP ProLiant BL25p (2 proc, 2.6GHz, Opteron)			7153	10400
HP ProLiant BL25p (1 proc, 2.6GHz, Opteron)	PGI 5.2-4 -O2 -tp k8-64 -mp	1593	3938	5200
Intel Xeon EM64T (Nocona 3.2 Ghz)	ifort -fast	1593		6400
HP ProLiant DL585 (4 proc (1 cpu core per single chip), 2.6GHz 852 Opteron)			11970	20800
HP ProLiant DL585 (2 proc (1 cpu core per single chip), 2.6GHz 852 Opteron)			7098	10400
HP ProLiant DL585 (1 proc (1 cpu core per single chip), 2.6GHz 852 Opteron)	PGI 5.2-4 -fastsse -tp k8-64 -mp	1586	3879	5200
HP ProLiant DL385 (2 proc, 2.6GHz, Opteron)			7134	10400
HP ProLiant DL385 (1 proc, 2.6GHz, Opteron)	PGI 5.2-4 -O2 -tp k8-64 -mp	1586	3917	5200

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
HP ProLiant DL585 (4 proc, 2.6GHz, Opteron)			11450	20800
HP ProLiant DL585 (2 proc, 2.6GHz, Opteron)			6913	10400
HP ProLiant DL585 (1 proc, 2.6GHz, Opteron)	PGI 5.2-4 -O2 -tp k8-64 -mp	1586	3836	5200
Pentium IV with 3.0 GHz	ifort -O3 -xW -ip -ipo -align -pad	1573	3181	6000
Intel Pentium 4 3.0 GHz (Northwood core)	ifort -xW -O3 -ipo -static -r8	1571	3650	6000
HP ProLiant BL20p G3 (2 proc 3.6GHZ)			7200	14400
HP ProLiant BL20p G3 (1 proc 3.6GHZ)	ifort -fpp -xP -O3	1565	4403	7200
IBM eServer pSeries 655 (8 proc 1.7GHz)			25630	54400
IBM eServer pSeries 655 (4 proc 1.7GHz)			14730	27200
IBM eServer pSeries 655 (1 proc 1.7GHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1486	3884	6800
HP ProLiant BL45p (8 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)			15830	38400
HP ProLiant BL45p (4 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)			11460	19200
HP ProLiant BL45p (2 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)			6626	9600
HP ProLiant BL45p (1 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64	1473	3604	4800
HP ProLiant BL25p (4 proc (2 cpu cores per single chip), 2.4GHz AMD 280 Opteron)			11590	19200
HP ProLiant BL25p (2 proc (2 cpu cores per single chip), 2.4GHz AMD 280 Opteron)			6715	9600
HP ProLiant BL25p (1 proc (2 cpu cores per single chip), 2.4GHz AMD 280 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64	1471	3654	4800
IBM eServer pSeries 690 (16 proc 1.7GHz)			36530	108800
IBM eServer pSeries 690 (8 proc 1.7GHz)			25130	54400
HP ProLiant DL385 (4 proc (2 cpu cores per single chip), 2.4GHz AMD 280 Opteron)			11570	19200
HP ProLiant DL385 (2 proc (2 cpu cores per single chip), 2.4GHz AMD 280 Opteron)			6662	9600
HP ProLiant DL385 (1 proc (2 cpu cores per single chip), 2.4GHz AMD 280 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64	1470	3657	4800
HP ProLiant DL585 (8 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)			15020	38400
HP ProLiant DL585 (4 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)			11320	19200
HP ProLiant DL585 (2 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)			6566	9600
HP ProLiant DL585 (1 proc (2 cpu cores per single chip), 2.4GHz AMD 880 Opteron)	SuSE SLES 9 / PGI 5.2-4 Compile Flags: -fastsse -tp k8-64 -mp	1467	3581	4800
HP DL385 2.2 GHz (dual core) Opteron 275	ifort -O3 -xW -ipo	1464		4400
IBM eServer pSeries 690 Tubro (1 proc 1.7GHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1462	3817	6800
HCL Infiniti Global Line 2700HL Xeon EM64T	ifort -fast -ip -ipo -r8 -align	1444	6167	9600

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
(Dual Core) 2.4 GHz				
HCL Infiniti Global Line 2700AF Xeon EM64T (Dual Core) 2.4 GHz	ifort -fast -ip -ipo -r8 -align	1438	6131	9600
HCL Infiniti Global Line 2700JR2 (Intel Xeon EM64T 3.8 GHz)	ifort -fast -ip -ipo -r8 -align	1433	5144	7600
HCL Infiniti Global Line 2700BD2 (Intel Xeon 3.16 GHz)	ifort -fast -r8 -align -ip -ipo	1428	4474	6320
Intel Pentium 4 (3.06 GHz)	ifc -O3 -r8 -xW -ip -ipo -align -pad	1414	2880	6120
AMD Opteron 275/2.2 Ghz (dual core, 4 proc)			6147	17600
AMD Opteron 275/2.2 Ghz (dual core, 2 proc)			4630	8800
AMD Opteron 275/2.2 Ghz (dual core, 1 proc)	ifort -O3 -xW -ipo	1385	2447	4400
HP ProLiant BL45p (8 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)			14120	35200
HP ProLiant BL45p (4 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)			10570	17600
HP ProLiant BL45p (2 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)			6113	8800
HP ProLiant BL25p (4 proc (2 cpu cores per single chip), 2.2GHz 275 Opteron)			10730	17600
HP ProLiant BL25p (2 proc (2 cpu cores per single chip), 2.2GHz 275 Opteron)			6158	8800
HP ProLiant BL25p (1 proc (2 cpu cores per single chip), 2.2GHz 275 Opteron)	PGI 5.2-4 -fastsse -tp k8-64	1350	3347	4400
HP ProLiant DL385 (4 proc (2 cpu cores per single chip), 2.2GHz 275 Opteron)			10600	17600
HP ProLiant DL385 (2 proc (2 cpu cores per single chip), 2.2GHz 275 Opteron)			6115	8800
HP ProLiant DL385 (1 proc (2 cpu cores per single chip), 2.2GHz 275 Opteron)	PGI 5.2-4 -fastsse -tp k8-64	1349	3352	4400
HP ProLiant BL45p (1 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)	PGI 5.2-4 -fastsse -tp k8-64	1349	3325	4400
HP ProLiant DL585 (8 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)			14040	35200
HP ProLiant DL585 (4 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)			10480	17600
HP ProLiant DL585 (2 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)			6083	8800
HP ProLiant DL585 (1 proc (2 cpu cores per single chip), 2.2GHz 875 Opteron)	PGI 5.2-4 -fastsse -tp k8-64	1348	3301	4400
Intel Pentium 4 (2.8 GHz)	ifc -O3 -xW -ipo -ip -align	1317	2444	5600
IBM eServer p5 575 (1.5 GHz POWER5)	-O3 -qarch=pwr5 -qtune=pwr5 -Pv -Wp,-ea478,-g1	1315		6000
HP ProLiant BL35p (2 proc, 2.4GHz, Opteron)			6460	9600
HP ProLiant BL35p (1 proc, 2.4GHz, Opteron)	PGI 5.2-4 -O2 -tp k8-64 -mp	1300	3583	4800
IBM eServer pSeries 670 (16 proc 1.5GHz)			33980	96000
IBM eServer pSeries 670 (8 proc 1.5GHz)			22860	48000
IBM eServer pSeries 670 (1 proc 1.5GHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv	1294	3401	6000

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
	-Wp,-ea478,-g1			
IBM eServer pSeries 655 (8 proc 1.5GHz)			22770	48000
IBM eServer pSeries 655 Tubro (1 proc 1.5GHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1293	3421	6000
HP ProLiant DL585 (4 CPU, 2.4GHz 850 Opteron)	SuSE SLES 9 / PGI 5.2-4 -O2 -tp k8-64 -mp		10540	19200
HP ProLiant DL585 (2 CPU, 2.4GHz 850 Opteron)	SuSE SLES 9 / PGI 5.2-4 -O2 -tp k8-64 -mp		6313	9600
HP ProLiant DL585 (1 CPU, 2.4GHz 850 Opteron)	SuSE SLES 9 / PGI 5.2-4 -O2 -tp k8-64	1293	3489	4800
IBM IntelliStation POWER 275 2 CPUs (1450 MHz POWER4+)			5993	11600
HP ProLiant DL145 (2 CPU, 2.4GHz 250 Opteron)	SuSE SLES 9 / PGI 5.2-4 -O2 -tp k8-64 -mp		6369	9600
HP ProLiant DL145 (1 CPU, 2.4GHz 250 Opteron)	SuSE SLES 9 / PGI 5.2-4 -O2 -tp k8-64	1291	3485	4800
IBM IntelliStation POWER 275 1 CPU (1450 MHz POWER4+)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1245	3338	5800
IBM eServer pSeries 630 6E4 (4 proc 1.45GHz)			10990	23200
IBM eServer pSeries 630 6E4 (1 proc 1.45GHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1229	3297	5800
IBM eServer pSeries 630 6C4 (4 proc 1.45GHz)			10990	23200
IBM eServer pSeries 630 6C4 (1 proc 1.45GHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1229	3297	5800
NEC SX-6/1 (8 proc. 1.77 ns)			46260	72000
NEC SX-6/1 (4 proc. 1.77 ns)			26540	36000
NEC SX-6/1 (2 proc. 1.77 ns)			15020	18000
NEC SX-6/1 (1proc. 1.77 ns)	SUPER-UX R13.1 -pi -Wf"-prob_use"	1289	8553	9000
AMD Opteron (2.192 GHz)	PGI -fastsse -tp k8-64	1253	3145	4284
IBM eServer pSeries 650 6M2 8 proc(1450 MHz)			19930	46400
IBM eServer pSeries 650 6M2 4 proc(1450 MHz)			11190	23200
IBM eServer pSeries 650 6M2 2 proc(1450 MHz)			6165	11600
IBM eServer pSeries 650 6M2 1 proc(1450 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1220	3245	5800
Intel Pentium 4 (2.53 GHz)	ifc -O3 -xW -ipo -ip -align	1190	2355	5060
NEC SX-6/8 (8proc. 2.0 ns)			41520	64000
NEC SX-6/4 (4proc. 2.0 ns)			23680	32000
NEC SX-6/2 (2proc. 2.0 ns)			13350	16000
NEC SX-6/1 (1proc. 2.0 ns)	R12.1 -pi -Wf"-prob_use"	1161	7575	8000
Fujitsu VPP5000/1(1 proc.3.33ns)	frt -Wv,-r128 -Of -KA32	1156	8784	9600
IBM eServer pSeries 655 651 4 proc(1300 MHz)			10880	20800
IBM eServer pSeries 655 651 1 proc(1300 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1135	2899	5200
Cray T932 (32 proc. 2.2 ns)			29360	57600

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Cray T928 (28 proc. 2.2 ns)			28340	50400
Cray T924 (24 proc. 2.2 ns)			26170	43200
Cray T916 (16 proc. 2.2 ns)			19980	28800
Cray T916 (8 proc. 2.2 ns)			10880	14400
Cray T94 (4 proc. 2.2 ns)	f90 -O3,inline2	1129	5735	7200
HP AlphaServer GS1280 7/1300 (8 proc 1.3 GHz)			14260	20800
HP AlphaServer GS1280 7/1300 (4 proc 1.3 GHz)			7781	10400
HP AlphaServer GS1280 7/1300 (2 proc 1.3 GHz)			3890	5200
HP AlphaServer GS1280 7/1300 (1 proc 1.3 GHz)	-fast -O4 -tune ev7 -arch ev7 -non_shared -lm	1122	2132	2600
hp rx5670 Itanium 2(4 proc 1GHz)			11430	16000
hp rx5670 Itanium 2(2 proc 1GHz)			6284	8000
hp rx5670 Itanium 2(1 proc 1GHz)	f90 +DSmckinley +O3 +Oinline_budget=100000 +Ono_ptrs_to_globals	1102	3534	4000
hp rx2600 Itanium 2(2 proc 1GHz)			6251	8000
hp rx2600 Itanium 2(1 proc 1GHz)	f90 +DSmckinley +O3 +Oinline_budget=100000 +Ono_ptrs_to_globals	1102	3528	4000
hp zx6000 Itanium 2(2 proc 1GHz)			6315	8000
hp zx6000 Itanium 2(1 proc 1GHz)	f90 +DSmckinley +O3 +Oinline_budget=100000 +Ono_ptrs_to_globals	1102	3533	4000
IBM eServer pSeries 690 Turbo 16 proc(1300 MHz)			28080	83200
IBM eServer pSeries 690 Turbo 8 proc(1300 MHz)			18290	41600
IBM eServer pSeries 690 Turbo 1 proc(1300 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1074	2894	5200
Intel Xeon 2.4 GHz	ifort -ipo	1055		4800
Intel P4 2200 MHz	ifc -O3 -xW -align -ipo -Zp16 -r8	1033	1911	4400
IBM eServer pSeries 615 6C3 (1 proc 1.2GHz P4+)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1032		4800
IBM eServer pSeries 615 6E3 (1 proc 1.2GHz P4+)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1032		4800
hp AlphaServer ES45 68/1250(4 proc)			7132	10000
hp AlphaServer ES45 68/1250(2 proc)			3721	5000
hp AlphaServer ES45 68/1250(1 proc)	v5.5-1877 -O4	1031	1945	2500
Cray T94 (3 proc. 2.2 ns)	f90 -O3,inline2	1029	4387	5400
IBM eServer pSeries 630 6C4 (4 proc 1.2GHz P4+)			9255	19200
IBM eServer pSeries 630 6C4 (1 proc 1.2GHz p4+)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1025	2727	4800
IBM eServer pSeries 630 6E4 (4 proc 1.2GHz P4+)			9255	19200

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
IBM eServer pSeries 630 6E4 (1 proc 1.2GHz p4+)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	1025	2727	4800
Intel xeon 64 (dual 3.6 GHz)	icf -O3	1010		7200
HP AlphaServer ES80 7/1150 (8 proc 1.15 GHz)			11410	18400
HP AlphaServer ES80 7/1150 (4 proc 1.15 GHz)			6584	9200
HP AlphaServer ES80 7/1150 (2 proc 1.15 GHz)			3424	4600
HP AlphaServer ES80 7/1150 (1 proc 1.15 GHz)	-fast -O4 -tune ev7 -arch ev7 -non_shared -lm	992	1884	2300
HP AlphaServer ES47 7/1150 (4 proc 1.15 GHz)			6584	9200
HP AlphaServer ES47 7/1150 (2 proc 1.15 GHz)			3424	4600
HP AlphaServer ES47 7/1150 (1 proc 1.15 GHz)	-fast -O4 -tune ev7 -arch ev7 -non_shared -lm	992	1884	2300
hp zx2000 Itanium 2(900MHz)	f90 +DSmckinley +O3 +Oinline_budget=100000 +Ono_ptrs_to_globals	992	3081	3600
Fujitsu Siemens hpcLine(Xeon 2GHz)	fc -O3 -align -r8 -ipo -xW	969	1648	2000
AMD Opteron 242/1.6 Ghz (2 proc)			3377	6400
AMD Opteron 242/1.6 Ghz (1 proc)	ifort -xW -ipo -O3	988	1808	3200
Cray SV1ex-1-32(31 proc,500MHz)			15520	62000
Cray SV1ex-1-32(28 proc,500MHz)			15250	56000
Cray SV1ex-1-32(24 proc,500MHz)			14750	48000
Cray SV1ex-1-32(20 proc,500MHz)			14150	40000
Cray SV1ex-1-32(16 proc,500MHz)			13050	32000
Cray SV1ex-1-32(12 proc,500MHz)	f90 -O3,inline2	988	11250	24000
HCL Infiniti Global line 4700HW (Intel Xeon 3.16 GHz)	ifort -fast -r8 -align	981	3209	6320
Cray T94 (2 proc. 2.2 ns)	f90 -O3,inline2	962	2998	3600
IBM eServer pSeries 655 651 8 proc(1100 MHz)			16170	35200
IBM eServer pSeries 655 651 1 proc(1100 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	937	2484	4400
Cray SV1ex-1-32(8 proc,500MHz)			8938	16000
Cray SV1ex-1-32(4 proc,500MHz)			5358	8000
Cray SV1ex-1-32(2 proc,500MHz)			2947	4000
Cray SV1ex-1-32(1 proc,500MHz)	f90 -O3,inline2	935	1554	2000
hp GS1280 7/1150 (4 proc,1.15 GHz)			6584	9200
hp GS1280 7/1150 (2 proc,1.15 GHz)			3493	4600
hp GS1280 7/1150 (1 proc,1.15 GHz)	KAP -O4	914	1879	2300
AMD Opteron 242/1.6 Ghz (2 proc)			4370	6400
Intel Xeon 2.4 GHz	ifort -O3	884		4800
AMD Opteron 242/1.6 Ghz (1 proc)	pgf77 -fast -tp k8-64	882	2325	3200
Dell PowerEdge 1850s (3.2 GHz Intel	Intel 9 FORTRAN	873	2800	6400

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
EM64T)				
IBM IntelliStation POWER 275 1 CPU (1000 MHz POWER4+)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	860	2327	4000
NEC SX-5/1 (1 proc. 4.0 ns)	R9.1 -pi -wf"-prob_use"	856	7280	8000
HP 9000 rp8420-32 (1000MHz PA-8800), 8 proc			14150	32000
HP 9000 rp8420-32 (1000MHz PA-8800), 4 proc			9478	16000
HP 9000 rp8420-32 (1000MHz PA-8800), 2 proc			5435	8000
HP 9000 rp8420-32 (1000MHz PA-8800), 1 proc	HP-UX 11i, HP f90 11.11.74 f90 +O3 +Onolimit +Onodataprefetch +Oinline_budget=1000000 +Oloop_unroll=6	843	2905	4000
HP 9000 Superdome (1000MHz PA-8800), 8 proc			14070	32000
HP 9000 Superdome (1000MHz PA-8800), 4 proc			9260	16000
HP 9000 Superdome (1000MHz PA-8800), 2 proc			5432	8000
HP 9000 Superdome (1000MHz PA-8800), 1 proc	HP-UX 11i, HP f90 11.11.74 f90 +O3 +Onolimit +Onodataprefetch +Oinline_budget=1000000 +Oloop_unroll=6	843	2902	4000
IBM eServer pSeries 630 6C4 4 proc(1000 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1		6769	16000
IBM eServer pSeries 630 6C4 1 proc(1000 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	842	2173	4000
IBM eServer pSeries 630 6E4 4 proc(1000 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1		6769	16000
IBM eServer pSeries 630 6E4 1 proc(1000 MHz)	-O3 -qarch=pwr4 -qtune=pwr4 -Pv -Wp,-ea478,-g1	842	2173	4000
AMD Athlon MP1800+(1 proc 1530MHz)	ifc -O3 -tpp6 -ipo	832	1705	3060
Compaq ES45 (4 proc. 1000 MHz)			5522	8000
Compaq ES45 (3 proc. 1000 MHz)			4076	6000
Compaq ES45 (2 proc. 1000 MHz)			2901	4000
Compaq ES45 (1 proc. 1000 MHz)	kf77 -fkapargs='-inline=daxpy -ur=8 -ur2=320' -arch host -assume nounderscore	824	1542	2000
NEC SX-5/16 (16 proc. 4.0 ns)			45030	64000
NEC SX-5/8 (8 proc. 4.0 ns)			32570	64000
NEC SX-5/4 (4 proc. 4.0 ns)			19220	32000
NEC SX-5/2 (2 proc. 4.0 ns)			11150	16000
Fujitsu VPP800/1 (1 proc 4.0ns)	frt -Wv,-r128 -Of -KA32	813	7091	8000
Intel P4 1700 MHz	ifc -O3 -xW -align -r8 -ipo	796		3400
hp ES80 7/1000(4 proc,1 GHz)			5706	8000
hp ES80 7/1000(2 proc,1 GHz)			3003	4000
hp ES80 7/1000(1 proc,1 GHz)	KAP -O4	790	1635	2000

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
hp ES47 7/1000(4 proc,1 GHz)			5706	8000
hp ES47 7/1000(2 proc,1 GHz)			3003	4000
hp ES47 7/1000(1 proc,1 GHz)	KAP -O4	790	1635	2000
HP Superdome (16 proc 875 MHz)			19210	56000
HP Superdome (8 proc 875 MHz)			12370	28000
HP Superdome (4 proc 875 MHz)			7257	14000
HP Superdome (2 proc 875 MHz)			4046	7000
AMD Opteron 1.4 GHz	-O3 -tpp7 -axK -ipo -align -r8	781	2020	3800
HP Superdome (1 proc 875 MHz)	f90 +O3 +Oinlinebudget=1000000 +Onodataprefetch +Oloop_unroll=6	769	2305	3500
hp server rp8400(16 proc 875MHz)			17750	56000
hp server rp8400(8 proc 875MHz)			11710	28000
hp server rp8400(4 proc 875MHz)			7096	14000
hp server rp8400(2 proc 875MHz)			4033	7000
hp server rp8400(1 proc 875MHz)	f90 +O3 +Oinlinebudget=1000000 +Onodataprefetch +Oloop_unroll=6	769	2320	3500
hp server rp7410(8 proc 875MHz)			12900	28000
hp server rp7410(4 proc 875MHz)			7507	14000
hp server rp7410(2 proc 875MHz)			4179	7000
hp server rp7410(1 proc 875MHz)	f90 +O3 +Oinlinebudget=1000000 +Onodataprefetch +Oloop_unroll=6	769	2337	3500
Cray SV1-1-32 (31 proc. 300 MHz)			10910	37200
Cray SV1-1-32 (28 proc. 300 MHz)			10770	33600
Cray SV1-1-32 (24 proc. 300 MHz)			10420	28800
Cray SV1-1-32 (20 proc. 300 MHz)			9945	24000
Cray SV1-1-32 (16 proc. 300 MHz)	f90 -O3, inline2	751	9156	19200
Cray SV1-1-32 (12 proc. 300 MHz)	f90 -O3, inline2	748	7837	14000
Tyan S2460/AMD Athlon XP(1533 MHz,2 proc)			2176	6132
Tyan S2460/AMD Athlon XP(1533 MHz,1 proc)	ifc -tpp6 -O3	732	1623	3066
Intel P4 ACER(Veriton 7200)1700 MHz	ifc -O3 -xW -align -r8 -ipo	712		3400
Cray SV1-1-32 (8 proc. 300 MHz)	f90 -O3, inline2	710	6055	9600
Cray T94 (1 proc. 2.2 ns)	f90 -O3,inline2	705	1603	1800
AMD Athlon Thunderbird 1.4GHz	ifc -O3 -tpp6 -align -r8 -ipo	704		2800
Compaq DS20L 833 MHz (2 proc.)			2316	3332
Compaq DS20L 833 MHz	kf77 -fkapargs='-inline=daxpy -ur=8 -ur2=320' -arch host -assume nounderscore	699	1232	1666
Fujitsu Siemens Celsius 460 (P4, 1.5 GHz)	Intel fortran90 -O3 -xW -align -r8	675	955	1500

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
HP SuperDome (16 proc 750 MHz)			17660	48000
HP SuperDome (8 proc 750 MHz)			11260	24000
HP SuperDome (4 proc 750 MHz)			6667	12000
HP SuperDome (2 proc 750 MHz)			3711	6000
HP SuperDome (1 proc 750 MHz)	f90 +O3 +Oinlinebudget=1000000 +Onodataprefetch +Oloop_unroll=6	669	2099	3000
hp server rp8400(16proc 750 MHz)			16500	48000
hp server rp8400(8 proc 750 MHz)			10810	24000
hp server rp8400(4 proc 750 MHz)			6522	12000
hp server rp8400(2 proc 750 MHz)			3681	6000
hp server rp8400(1 proc 750 MHz)	f90 +O3 +Oinlinebudget=1000000 +Onodataprefetch +Oloop_unroll=6	669	2099	3000
hp server rp7400(8 proc 750 MHz)			10550	24000
hp server rp7400(4 proc 750 MHz)			6667	12000
hp server rp7400(2 proc 750 MHz)			3681	6000
hp server rp7400(1 proc 750 MHz)	f90 +O3 +Oinlinebudget=1000000 +Onodataprefetch +Oloop_unroll=6	669	2085	3000
AMD ATHLON Thunderbird 1.2GHz	ifc -tpp7 -O3 -ipo	649	1402	2400
Compaq ES40 (833 MHz 4cpu)			4626	6664
Compaq ES40 (833 MHz 2cpu)			2411	3332
Compaq ES40 (833 MHz 1cpu)	-assume nounderscore -O5	639	1277	1666
Dell PE7150 Itanium(800Mhz 4 proc)			7358	12800
Dell PE7150 Itanium(800Mhz 2 proc)			4504	6400
Dell PE7150 Itanium(800Mhz 1 proc)	efl -Ox -Ob2 -Ot	600	2382	3200
Cray T3E-1350 (16 proc 675 MHz)			3204	24000
Cray T3E-1350 (12 proc 675 MHz)			2716	18000
Cray T3E-1350 (8 proc 675 MHz)			2518	12000
Cray T3E-1350 (6 proc 675 MHz)			2199	9000
Cray T3E-1350 (4 proc 675 MHz)			1797	6000
Cray T3E-1350 (2 proc 675 MHz)			1197	3000
Cray T3E-1350 (1 proc 675 MHz)	f90 ver. 3.5 -O3,inline2	591	728	1500
Cray SV1-1-32 (4 proc. 300 MHz)	f90 -O3, inline2	596	3574	4800
Intel/HP Itanium 800 MHz	f90 +Ofast +O3 +Onodataprefetch	580	2282	3200
HP i2000 Itanium 800 MHz(2 proc)			3888	6400
HP i2000 Itanium 800 MHz(1 proc)	f90 +Ofast +O3 +Onodatapretch	580	2282	3200
NEC SX-4/32 (32 proc. 8.0 ns)			31060	64000
NEC SX-4/24 (24 proc. 8.0 ns)			27440	48000

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
NEC SX-4/16 (16 proc. 8.0 ns)			21470	32000
NEC SX-4/8 (8 proc. 8.0 ns)			12780	16000
NEC SX-4/4 (4 proc. 8.0 ns)			6780	8000
NEC SX-4/2 (2 proc. 8.0 ns)			3570	4000
NEC SX-4/1 (1 proc. 8.0 ns)	137 R6.1 -fopp f=x inline	578	1944	2000
AMD Athlon Thunderbird 1200 Mhz	g77 -s -static -O3 -fomit-frame-pointer -Wall -mpentiumpro -march=pentiumpro -malign-functions=4 -funroll-loops -fexpensive-optimizations -malign-double -fschedule-insns2 -mwide-multiply	558	1029	2400
Compaq Server DS20e(2 proc 667MHz)			1923	2668
Compaq Server DS20e(667 MHz)		558	1025	1334
Compaq Server ES40(4 proc 667MHz)			3804	5336
Compaq Server ES40(2 proc 667MHz)			1923	2668
Compaq Server ES40(1 proc 667MHz)	kf77 -fkapargs='-inline=daxpy -ur=12 -ur2=320 ' -O5 -tune ev5 -assume nounderscore	561	1031	1334
Cray SV1-1-32 (2 proc. 300 MHz)			1959	2400
Cray SV1-1-32 (1 proc. 300 MHz)	f90 -O3, inline2	549	1028	1200
NEC SX-4B/2(2proc.8.8ns)			3246	3636
NEC SX-4B/1(1proc.8.8ns)	R7.1 -fopp f=x inline	524	1767	1818
Tyan S2518/PentiumIII(1266 MHz,2 proc)			1478	2532
Tyan S2518/PentiumIII(1266 MHz,1 proc)	ifc -tpp6 -O3	503	830	1266
IBM RS/6000 44P-270 4 proc (450MHz,8MBL2)			4396	7200
IBM RS/6000 44P-270 2 proc (450MHz,8MBL2)			2521	3600
IBM RS/6000 44P-270 1 proc(450MHz,8MBL2)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	503	1451	1800
IBM eServer pSeries 610 Model B80 4 proc(450 MHz 8MB L2)			4396	7200
IBM eServer pSeries 610 Model B80 2 proc(450 MHz 8MB L2)			2521	3600
IBM eServer pSeries 610 Model B80 1 proc(450 MHz 8MB L2)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	503	1451	1800
IBM eServer pSeries 610 Model 6E1 2 proc(450 MHz 8MB L2)			2521	3600
IBM eServer pSeries 610 Model 6E1 1 proc(450 MHz 8MB L2)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	503	1451	1800
IBM eServer pSeries 610 Model 6C1 2 proc(450 MHz 8MB L2)			2521	3600
IBM eServer pSeries 610 Model 6C1 1 proc(450 MHz 8MB L2)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	503	1451	1800
IBM RS/6000 44P-170 (450 MHz)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	503	1440	1800

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
NEC SX-4/Ce (1 proc.)	R7.1 -fopp f=x inline	500	980	1000
AMD Duron 900 (900 MHz)	ifc -static -O3 -tpp6 -ipo	486	977	1800
Fujitsu Siemens Celsius 460 (P4, 1.5 GHz)	pgf90 -fast	483	955	1500
Cray C90 (16 proc. 4.2 ns)	CF77 5.0 -Zp -Wd-e68	479	10780	15238
HP SuperDome (16 proc 552 MHz)			12220	35328
HP SuperDome (8 proc 552 MHz)			8055	17664
HP SuperDome (4 proc 552 MHz)			4319	8832
HP SuperDome (2 proc 552 MHz)			2506	4416
HP SuperDome (1 proc 552 MHz)	f77 +O3 +Oinline=daxpy	470	1497	2208
Cray C90 (8 proc. 4.2 ns)	CF77 5.0 -Zp -Wd-e68	468	6175	7619
HP N4000 (8 proc. 550 MHz)			7762	17600
HP N4000 (4 proc. 550 MHz)			4494	8800
HP N4000 (2 proc. 550 MHz)			2662	4400
HP N4000 (1 proc. 550 MHz)	f77 +O3 +Oinline=daxpy	468	1583	2200
NEC SX-4/16A(16proc.8.0ns)			20620	32000
NEC SX-4/8A(8proc.8.0ns)			12490	16000
NEC SX-4/4A(4proc.8.0ns)			6692	8000
NEC SX-4/2A(2proc.8.0ns)			3525	4000
NEC SX-4/1A(1proc.8.0ns)	R7.1 -fopp f=x inline	467	1929	2000
NEC SX-4B/2A (2 proc. 8.8 ns)			3204	3636
HP V2600 (16 proc 550 MHz)			9068	35200
HP V2600 (8 proc 550 MHz)			6323	17600
HP V2600 (4 proc 550 MHz)			3448	8800
HP V2600 (2 proc 550 MHz)			2030	4400
Hewlett-Packard V2600(550 MHz)	f77 +O3 +Oinline=daxpy	465	1221	2200
Compaq 8400 6/575(8proc 1.7 ns)			5305	9600
Compaq 8400 6/575(6proc 1.7 ns)			4085	6900
Compaq 8400 6/575(4proc 1.7 ns)			3003	4600
Compaq 8400 6/575(2proc 1.7 ns)			1615	2300
Compaq 8400 6/575(1proc 1.7 ns)	kf77 -fkapargs='-inline=daxpy -ur=12' -tune ev6 -O5	460	847	1150
NEC SX-4B/e (1 proc. 8.8ns)	R7.1 -fopp f=x inline	454	890	909
AMD Opteron (1 proc. 1200 MHz)	g77 -O3 -fforce-addr -fomit-frame-pointer -funroll-loops -frerun-cse-after-loop -frerun-loop-opt -falign-functions=4 -static -s -fexpensive-optimizations -fschedule-insns2	443		2400
Compaq Alpha Server DS20/500MHz	kf77 -fkapargs='-inline=daxpy -ur=12'	440		1000

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
	-tune ev6 -O5			
Compaq 8200 6/575(6proc 1.7 ns)			3981	6900
Compaq 8200 6/575(4proc 1.7 ns)			3003	4600
Compaq 8200 6/575(2proc 1.7 ns)			1615	2300
Compaq 8200 6/575(1proc 1.7 ns)	kf77 -fkapargs='-inline=daxpy -ur=12' -tune ev6 -O5	431	831	1150
NEC SX-4B/1A (1 proc. 8.8 ns)	R7.1 -fopp f=x inline	427	1753	1818
IBM RS/6K 44P-270(4 proc 375 MHz)			3879	6000
IBM RS/6K 44P-270(2 proc 375 MHz)			2101	3000
IBM RS/6K 44P-270(1 proc 375 MHz)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	426	1109	1500
IBM RS/6K 7026-B08(4 proc 375 MHz)			3879	6000
IBM RS/6K 7026-B08(2 proc 375 MHz)			2101	3000
IBM RS/6K 7026-B08(1 proc 375 MHz)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	426	1109	1500
IBM eServer pSeries 640 (4 proc,375MHz,4MB L2)			3879	6000
IBM eServer pSeries 640 (2 proc,375MHz,4MB L2)			2101	3000
IBM eServer pSeries 640 (1 proc,375MHz,4MB L2)	-qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	426	1109	1500
IBM RS/6K 44P-270 (4 proc,375MHz,4MB L2)			3879	6000
IBM RS/6K 44P-270 (2 proc,375MHz,4MB L2)			2101	3000
IBM RS/6K 44P-270 (1 proc,375MHz,4MB L2)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	426	1109	1500
IBM eServer pSeries 640 (4 proc,375MHz,8MB L2)			3902	6000
IBM eServer pSeries 640 (2 proc,375MHz,8MB L2)			2180	3000
IBM eServer pSeries 640 (1 proc,375MHz,8MB L2)	-qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	426	1234	1500
IBM RS/6K 44P-270 (4 proc,375MHz,8MB L2)			3902	6000
IBM RS/6K 44P-270 (2 proc,375MHz,8MB L2)			2180	3000
IBM RS/6K 44P-270 (1 proc,375MHz,8MB L2)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	426	1234	1500
IBM RS/6K SP Power3(16 proc 375 MHz)			7699	24000
IBM RS/6K SP Power3(12 proc 375 MHz)			7187	18000
IBM RS/6K SP Power3(8 proc 375 MHz)			5928	12000
IBM RS/6K SP Power3(4 proc 375 MHz)			3728	6000
IBM RS/6K SP Power3(1 proc 375 MHz)	-O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	424	1208	1500
Cray 3-128 (4 proc. 2.11 ns)	CSOS 1.0 level 129	421	2862	3792

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Compaq/DEC Alpha 21264 EV67 500 MHz	-O5 -arch host -tune host	412	637	1000
Hitachi S-3800/480(4 proc 2 ns)			20640	32000
Hitachi S-3800/380(3 proc 2 ns)			16880	24000
Hitachi S-3800/280(2 proc 2 ns)			12190	16000
Hitachi S-3800/180(1 proc 2 ns)	OSF/1 MJ FORTRAN:V03-00	408	6431	8000
IBM RS/6K SP (4 proc 375 MHz)			3700	6000
IBM RS/6K SP (2 proc 375 MHz)			2166	3000
IBM RS/6K SP (1 proc 375 MHz)	xlf 6.1.0.3 -O3 -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	409	1236	1500
Cray 3-128 (2 proc. 2.11 ns)	CSOS 1.0 level 129	393	1622	1896
Cray C90 (4 proc. 4.2 ns)	CF77 5.0 -Zp -Wd-e68	388	3275	3810
Cray C90 (2 proc. 4.2 ns)	CF77 5.0 -Zp -Wd-e68	387	1703	1905
Cray C90 (1 proc. 4.2 ns)	CF77 5.0 -Zp -Wd-e68	387	902	952
HP N4000 (8 proc. 440 MHz)			6410	14080
HP N4000 (4 proc. 440 MHz)			3724	7040
HP N4000 (2 proc. 440 MHz)			2212	3520
HP N4000 (1 proc. 440 MHz)	f77 +O3 +Oinline=daxpy	375	1290	1760
HP V2500 (16 proc. 440 MHz)			8217	28160
HP V2500 (12 proc. 440 MHz)			6914	21120
HP V2500 (8 proc. 440 MHz)			5111	14080
HP V2500 (4 proc. 440 MHz)			3041	7040
HP V2500 (2 proc. 440 MHz)			1751	3520
HP V2500 (1 proc. 440 MHz)	f77 +O3 +Oinline=daxpy	375	1047	1760
NEC SX-3/44R (4 proc. 2.5 ns)			15120	25600
NEC SX-3/42R (4 proc. 2.5 ns)			8950	12800
NEC SX-3/41R (4 proc. 2.5 ns)			4815	6400
NEC SX-3/34R (3 proc. 2.5 ns)			12730	19200
NEC SX-3/32R (3 proc. 2.5 ns)			6718	9600
NEC SX-3/31R (3 proc. 2.5 ns)			3638	4800
NEC SX-3/24R (2 proc. 2.5 ns)			9454	12800
NEC SX-3/22R (2 proc. 2.5 ns)			5116	6400
NEC SX-3/21R (2 proc. 2.5 ns)			2627	3200
NEC SX-3/14R (1 proc. 2.5 ns)	f77sx 040 R2.2 -pi*:*	368	5199	6400
NEC SX-3/12R (1 proc. 2.5 ns)	f77sx 040 R2.2 -pi*:*	368	2757	3200
Intel P4 1700 MHz	g77 -O3 -fomit-frame-pointer -funroll-loops	363	1393	3400

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
IBM eServer pSeries 620/6F1 6 CPUs(668 MHz 8 MB L2)			4529	8016
IBM eServer pSeries 620/6F1 4 CPUs(600 MHz 4 MB L2)			3144	4800
IBM eServer pSeries 620/6F1 2 CPUs(600 MHz 4 MB L2)			1650	2400
IBM eServer pSeries 620/6F1 1 CPU (600 MHz 2 MB L2)	xlf 7.1 -O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	360	833	1200
IBM eServer pSeries 660/6H1 6 CPUs(668 MHz 8 MB L2)			4529	8016
IBM eServer pSeries 660/6H1 4 CPUs(600 MHz 4 MB L2)			3144	4800
IBM eServer pSeries 660/6H1 2 CPUs(600 MHz 4 MB L2)			1650	2400
IBM eServer pSeries 660/6H1 1 CPU (600 MHz 2 MB L2)	xlf 7.1 -O -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -Pv -Wp,-ea478,-g1	360	833	1200
Acer TravelMate 803LMi Intel Pentium M (1.6GHz)	f77 -O3	352		3200
Sun UltraSparc III 750 MHz	-fast -native -xsafe=mem -dalign -xO5 -xarch=v8plusa -xchip=ultra	343	769	1500
Cray 3-128 (1 proc. 2.11 ns)	CSOS 1.0 level 129	327	876	948
Intel P4 1500 MHz	g77 -O3 -fomit-frame-pointer -funroll-loops	326	1311	3000
Gigabyte GA-7VX/AMD Athlon(700 MHz)	ifc -tpp6 -O3	317	772	1400
IBM RS6000/397(160 MHz ThinNode)	-qarch=pwr2 -qhot -O3 -Pv -Wp,-ea478,-g1	315	532	640
Compaq XP1000 (500 MHz)	kf77 -tune ev6 -O5 -fkapargs='-inline=daxpy -ur=12'	335		1000
NEC SX-3/44 (4 proc. 2.9 ns)			13420	22000
NEC SX-3/24 (2 proc. 2.9 ns)			8149	11000
NEC SX-3/42 (4 proc. 2.9 ns)			7752	11000
NEC SX-3/22 (2 proc. 2.9 ns)			4404	5500
NEC SX-3/14 (1 proc. 2.9 ns)	f77sx 020 R1.13 -pi*:*	314	4511	5500
NEC SX-3/12 (1 proc. 2.9 ns)	f77sx 020 R1.13 -pi*:*	313	2283	2750
DEC 8400 5/625(8 proc,612 MHz)			3608	9792
DEC 8400 5/625(4 proc,612 MHz)			2377	4896
DEC 8400 5/625(2 proc,612 MHz)			1375	2448
DEC 8400 5/625(1 proc,612 MHz)	f77 -O5 -fast	287	764	1224
Apple PowerPC G4 1 GHz	f90 -q -YEXT_SFX=_ -O3 -YEXT_NAMES=LCS -YCFRL=1	284	1000	2000
Cray Y-MP/832 (8 proc. 6 ns)	CF77 4.0 -Zp -Wd-e68	275	2144	2667
Compaq Alpha Server ds20/500MHz	-fast -O5 -arch ev6 -tune ev6	270		1000
DEC 8200 5/625(8 proc,612 MHz)			2696	9792
DEC 8200 5/625(4 proc,612 MHz)			2313	4896

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
DEC 8200 5/625(2 proc,612 MHz)			1366	2448
DEC 8200 5/625(1 proc,612 MHz)	f77 -O5 -fast	268	750	1224
IBM RS6K/595(135 MHz WideNode)	-qarch=pwr2 -qhot -O3 -Pv -Wp,-ea478,-g1	265	440	540
IBM RS6K SP Power3SMP(8 Proc 222 MHz)			3516	7104
IBM RS6K SP Power3SMP(6 Proc 222 MHz)			3014	5328
IBM RS6K SP Power3SMP(4 Proc 222 MHz)			2153	3552
IBM RS6K SP Power3SMP(2 Proc 222 MHz)			1247	1776
AMD Athlon (600 Mhz)	g77 -O3 -s -funroll-loops -fomit-frame-pointer	260	557	1200
IBM RS6K SP Power3SMP(1 Proc 222 MHz)	-O3 -Q -qfloat=hsflt -qarch=pwr3 -qtune=pwr3 -bnso -bI:/lib/syscalls.exp -Pv	250	684	888
Fujitsu VP2600/10 (3.2 ns)	FORTRAN77 EX/VP V11L10	249	4009	5000
DEC 500/500 (1 proc, 500 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5	235	590	1000
Intel Pentium III 933 MHz	g77 -O3 -fomit-frame-pointer -funroll-loops	234	514	933
IBM P2SC (120 MHz Thin Node)	-qarch=pwr2 -qhot -O3 -Pv -Wp,-ea478,-g1 -funroll-loops	233	406	480
Apple PowerPC G4 533 MHz	g77 -O3 -fomit-frame-pointer -funroll-loops	231	478	1066
DEC PersonalWorkstation 600	-O5 -fast -tune ev56 -inline all -speculate all	227		1200
Cray Y-MP/832 (4 proc. 6 ns)	CF77 4.0 -Zp -Wd-e68	226	1159	1333
Sun Ultra 80(4 proc 450MHz)			2062.0	3600
Sun Ultra 80(3 proc 450MHz)			1615.0	2700
Sun Ultra 80(2 proc 450MHz)			1172.0	1800
Sun Ultra 80 (450MHz/4MB L2)	-fast -xO5 -xarch=v8plusa -xchip=ultra	208	607	900
Fujitsu VPP500/1(1 proc. 10 ns)	FORTRAN77EX/VP V12L20	206	1490	1600
DEC 8400 5/440(8 proc, 440 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5		3112	7040
DEC 8100 5/440(4 proc, 440 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5		1945	3520
DEC 8100 5/440(2 proc, 440 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5		1090	1760
DEC 8100 5/440(1 proc, 440 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5	205	588	880
Cray Y-MP M98 (8 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	204	1733	2666
Fujitsu VX/1 (1 proc. 7 ns)	Fortran90/VP V10L10	203	1936	2200
Fujitsu VPP300/1 (1 proc. 7 ns)	Fortran90/VP V10L10	203	1936	2200
Fujitsu VPP700/1 (1 proc. 7 ns)	Fortran90/VP V10L10	203	1936	2200
Fujitsu VP2200/10 (3.2 ns)	FORTRAN77 EX/VP V12L10	203	1048	1250
HP Exemplar V-Class(16 proc.240 MHz)	+O3 +Oinline=daxpy		5935	15360

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
HP Exemplar V-Class(14 proc.240 MHz)	+O3 +Oinline=daxpy		5394	13440
HP Exemplar V-Class(12 proc.240 MHz)	+O3 +Oinline=daxpy		5202	11520
HP Exemplar V-Class(10 proc.240 MHz)	+O3 +Oinline=daxpy		4585	9600
HP Exemplar V-Class(8 proc.240 MHz)	+O3 +Oinline=daxpy		4125	7680
HP Exemplar V-Class(6 proc.240 MHz)	+O3 +Oinline=daxpy		3350	4760
HP Exemplar V-Class(4 proc.240 MHz)	+O3 +Oinline=daxpy		2414	3840
HP Exemplar V-Class(2 proc.240 MHz)	+O3 +Oinline=daxpy		1260	1920
HP Exemplar V-Class(1 proc.240 MHz)	HP-UX 11.0 +O3 +Oinline=daxpy	203	743	960
Cray 2S/4-128 (4 proc. 4.1 ns)	CSOS 1.0 level 129	202	1406	1951
NEC SX-3/11R (1 proc. 2.5 ns)	f77sx 040 R2.2 -pi*:*	202	1418	1600
NEC SX-3/1LR (1 proc. 2.5 ns)	f77sx 040 R2.2 -pi*:*	201	767	800
Hewlett-Packard C240 236 MHz	+O3 +Oinline=daxpy	197	667	944
Intel Pentium III 933 MHz	g77 -O3	192	507	933
DEC 500/400 (1 proc, 400 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5	189	449	800
DEC 4100 5/400(4 proc, 400 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5		1821	3200
DEC 4100 5/400(2 proc, 400 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5		1001	1600
DEC 4100 5/400(1 proc, 400 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5	189	531	800
DEC 1000A 5/400(1 proc, 400 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5	187	440	800
Sun HPC 450 (400 MHz, 4 proc)			1841	3200
Sun HPC 450 (400 MHz, 2 proc)			1050	1600
Sun HPC 450 (400 MHz, 4MB L2)	-fast -xO5 -xarch=v8plusa -xchip=ultra	183	552	800
Cray Y-MP/832 (2 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	181	604	667
Cray X-MP/416 (4 proc. 8.5 ns)	CF77 4.0 -Zp -Wd-e68	178	822	940
Cray Y-MP M98 (4 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	177	1114	1333
Sun UltraSparc II 300 MHz	-fast -native -xsafe=mem -dalign -xO5 -xarch=v8plusa -xchip=ultra	176	296	600
SGI Origin 2000 (300 Mhz,16 proc)			3970	9600
SGI Origin 2000 (300 Mhz, 8 proc)			3032	4800
SGI Origin 2000 (300 Mhz, 4 proc)			1957	2400
SGI Origin 2000 (300 Mhz, 2 proc)			1074	1200
SGI Origin 2000 (300 Mhz)	f77 -IPA -O3 -n32 -mips4 -r10000 -call_shared -TENV:X=4 -OPT:IEEE_arithmetic=3:roundoff=3 -LNO:blocking=off:ou_max=6:pf2=0 -INLINE:array_bounds	173	553	600
NEC SX-3/11 (1 proc. 2.9 ns)	f77sx 020 R1.13 -pi*:*	173	1223	1370
Sun UltraSparc II 300 MHz	-fast -native -xsafe=mem -dalign -xO5	172	285	600

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
	-xarch=v8plusa -xchip=ultra			
NEC SX-3/1L (1 proc. 2.9 ns)	f77sx 020 R1.13 -pi*:*	171	661	680
SGI Octane (360 MHz) IP30	f77 -O	170		720
Fujitsu VP2400/10 (4 ns)	FORTRAN77 EX/VP V11L10	170	1688	2000
HP Exemplar V-Class(16 proc.200 MHz)	HP-UX 11.0		4832	12800
HP Exemplar V-Class(14 proc.200 MHz)	HP-UX 11.0		4442	11200
HP Exemplar V-Class(12 proc.200 MHz)	HP-UX 11.0		4109	8400
HP Exemplar V-Class(10 proc.200 MHz)	HP-UX 11.0		3506	8000
HP Exemplar V-Class(8 proc.200 MHz)	HP-UX 11.0		3206	6400
HP Exemplar V-Class(6 proc.200 MHz)	HP-UX 11.0		2608	4200
HP Exemplar V-Class(4 proc.200 MHz)	HP-UX 11.0		1912	3200
HP Exemplar V-Class(2 proc.200 MHz)	HP-UX 11.0		1082	1600
HP Exemplar V-Class(1 proc.200 MHz)	HP-UX 11.0 +O3 +Oinline=daxpy	169	613	800
SGI Octane R12000 IP30 270 MHz	-O3 -64 -OPT:Olimit=15000 -TARG:platform=IP30 -LNO:blocking=OFF	169	400	540
Compaq Alpha 21164 EV56 533 MHz	g77 -O3 -fomit-frame-pointer -funroll-loops	168	508	1066
Cray 2S/4-128 (2 proc. 4.1 ns)	CSOS 1.0 level 129	167	741	976
Hewlett-Packard C200 200 MHz	+O3 +Oinline=daxpy	166	550	800
DEC 8400 5/350 (1 proc 350 MHz)	kf77 -fkapargs='-inline=daxpy -ur3=100' -tune ev5 -O5 -assume nounderscore	164	510	700
DEC 8400 5/300 (8 proc 300 MHz)			2282	4800
DEC 8400 5/300 (6 proc 300 MHz)			1902	3600
DEC 8400 5/300 (4 proc 300 MHz)			1351	2400
DEC 8400 5/300 (2 proc 300 MHz)			757	1200
Cray Y-MP/832 (1 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	161	324	333
ASUS P2B-F/Celeron(433 MHz,1 Proc)	ifc -tpp6 -O3	160	263	433
Convex C4/XA-4(4 proc) (7.41 ns)	fc9.0.0.5 -tm c4 -O3 -ds -ep 4 -is .	160	2531	3240
Hewlett-Packard K460-EG 180 MHz	+Oall +Oinline=daxpy	158	510	720
Hewlett-Packard C180-XP 180 MHz	+Oall +Oinline=daxpy	158	480	720
HP Exemplar S-Class (16 proc)	SPP-UX 5.2		4609	11520
HP Exemplar S-Class (14 proc)	SPP-UX 5.2		4217	10080
HP Exemplar S-Class (12 proc)	SPP-UX 5.2		4019	8640
HP Exemplar S-Class (10 proc)	SPP-UX 5.2		3389	7200
HP Exemplar S-Class (8 proc)	SPP-UX 5.2		2979	5760
HP Exemplar S-Class (6 proc)	SPP-UX 5.2		2305	4320
HP Exemplar S-Class (4 proc)	SPP-UX 5.2		1629	2880

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
HP Exemplar S-Class (2 proc)	SPP-UX 5.2		967	1440
HP Exemplar S-Class(1 proc)	SPP-UX 5.2+Oall +Oinline=daxpy	156	545	720
Sun UltraSPARC II(30 proc)336MHz			5187	20160
Sun UltraSPARC II(24 proc)336MHz			4755	16128
Sun UltraSPARC II(16 proc)336MHz			3981	10752
Sun UltraSPARC II(14 proc)336MHz			3721	9408
Sun UltraSPARC II(8 proc)336MHz			2481	5376
Sun UltraSPARC II(6 proc)336MHz			1990	4032
Sun UltraSPARC II(4 proc)336MHz			1438	2688
Sun UltraSPARC II(2 proc)336MHz			843	1344
Sun UltraSPARC II(1 proc)336MHz	-fast -xO5 -xarch=v8plusa -xchip=ultra -o	154	461	672
Cray Y-MP M98 (2 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	154	596	666
DEC AlphaStation 600 5/333 MHz	-fkapargs='-inline=daxpy -ur3=100' -tune ev5 -O5	153		666
Convex C4/XA-3(3 proc) (7.41 ns)	fc9.0.0.5 -tm c4 -O3 -ds -ep 3 -is .	151	1933	2430
Cray Y-MP M98 (1 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	150	307	333
Cray Y-MP M92 (2 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	145	550	666
Cray Y-MP M92 (1 proc. 6 ns)	CF77 5.0 -Zp -Wd-e68	145	332	333
Cray X-MP/416 (2 proc. 8.5 ns)	CF77 5.0 -Zp -Wd-e68	143	426	470
IBM RS/6000-R24 (71.5 MHz)	v3.1.1 xlf -Pv -Wp,-me,-ew -O3 -qarch=pwrx -qtune=pwrx -qhot-qhsflt -qnosave	142	246	284
DEC Alphastations 433 MHz	f90 -O	141		866
Hewlett-Packard C160 160 MHz	+Oall +Oinline=daxpy	140	421	640
IBM POWER2-990(71.5 MHz)	-O-Pv-Wp-ea478-g1-qarch=pwrx	140	254	286
DEC 4100 5/300(4 proc, 300 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5		1287	2400
DEC 4100 5/300(2 proc, 300 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5		734	1200
DEC 4100 5/300(1 proc, 300 MHz)	kf77 -inline=daxpy -ur=3 -fast -O5 -tune ev5	140	420	600
DEC 8400 5/350 (8 proc 350 MHz)			2853	5600
DEC 8400 5/350 (6 proc 350 MHz)			2313	4200
DEC 8400 5/350 (4 proc 350 MHz)			1678	2800
DEC 8400 5/350 (2 proc 350 MHz)			938	1400
DEC 8400 5/300 (1 proc 300 MHz)	-inline=daxpy -ur=3 -fast -O5 -tune ev5	140	411	600
DEC 8200 5/300 (6 proc 300 MHz)			1821	3600
DEC 8200 5/300 (4 proc 300 MHz)			1317	2400
DEC 8200 5/300 (2 proc 300 MHz)			752	1200

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
DEC 8200 5/300 (1 proc 300 MHz)	-inline=daxpy -ur=3 -fast -O5 -tune ev5	140	411	600
Pentium III (750 MHz)	gnu f77 -O3	138		750
SGI Octane R12000 IP30 270 MHz	-O3 -64 -OPT:Olimit=15000 -TARG:platform=IP30 -LNO:blocking=OFF	137	400	540
Apple PowerBook G4 (500 MHz)	g77 -v	135		1000
IBM RS/6000-59H (66 MHz)	v3.1.1 xlf -Pv -Wp,-me,-ew -O3 -qarch=pwrx -qtune=pwrx -qhot-qhsflt -qnosave	132	230	264
IBM POWER2 model 590(66 MHz)	-O-Pv-Wp,-ea478,-g1-qarch=pwrx	130	236	264
Convex C4/XA-2(2 proc) (7.41 ns)	fc9.0.0.5 -tm c4 -O3 -ds -ep 2 -is .	129	1335	1620
Cray J916 (16 proc. 10 ns)	CF77 6.0 -Zp -Wd-e68		2471	3200
Cray J916 (12 proc. 10 ns)	CF77 6.0 -Zp -Wd-e68		2046	2400
Cray J916 (8 proc. 10 ns)	CF77 6.0 -Zp -Wd-e68		1439	1600
Cray J916 (7 proc. 10 ns)	CF77 6.0 -Zp -Wd-e68	129	1254	1400
Fujitsu VP2200/10 (4 ns)	FORTRAN77 EX/VP V11L10	127	842	1000
SGI Octane (270 MHz) IP30	f77 -O	127		540
Cray J932 (32 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68		4486	6400
Cray J932 (28 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68		4235	5600
Cray J932 (24 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68		3775	4800
Cray J932 (20 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68		3238	4000
Cray J932 (16 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68		2709	3200
Cray J932 (12 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68		2029	2400
Cray J932 (8 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68		1425	1600
Cray J932 (7 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68	126	1221	1400
SGI POWER CHALLENGE (90 MHz,16 proc)			3240	5760
SGI POWER CHALLENGE (90 MHz,8 proc)			2045	2880
SGI POWER CHALLENGE (90 MHz,4 proc)			1124	1440
SGI POWER CHALLENGE (90 MHz,2 proc)			569	720
SGI POWER CHALLENGE (90 MHz,1 proc)	-non_shared -OPT: IEEE_arithmetic=3:roundoff=3 -TENV:X=4 -col120 -WK,-ur=12, -ur2=200 -WK,-so=3,-ro=3,-o=5 -WK,-inline=daxpy:dscal:idamax -SWP:max_pair_candidates=2 -SWP:strict_ivdep=false	126	308	360
Cray J916 (4 proc. 10 ns)	CF77 6.0 -Zp -Wd-e68	121	743	800
Cray X-MP/416 (1 proc. 8.5 ns)	CF77 5.0 -Zp -Wd-e68	121	218	235
Cray 2S/4-128 (1 proc. 4.1 ns)	CSOS 1.0 level 129	120	384	488
DEC 2100 5/250 (4 proc 250 MHz)			1022	2000

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
DEC 2100 5/250 (2 proc 250 MHz)			578	1000
DEC 2100 5/250 (1 proc 250 MHz)	-inline=daxpy -ur=3 -fast -O5 -tune ev5	119	317	500
Cray J932 (4 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68	117	730	800
ASUS P2B-D/PentiumIII(600 MHz,2 proc)			745	1200
ASUS P2B-D/PentiumIII(600 MHz,1 proc)	ifc -tpp6 -O3	116	410	600
IBM RS/6000 F50 (332 MHz,4 proc)			1049	2656
IBM RS/6000 F50 (332 MHz,3 proc)			842	1992
IBM RS/6000 F50 (332 MHz,2 proc)			599	1328
IBM RS/6000 F50 (332 MHz,1 proc)	-O -qhot -qarch=ppc -qfloat=hsflt -Pv -Wp,-ea478, -g1 -bnso -bI:/lib/syscalls.exp -bnodelcsect	116	317	664
SGI Origin 2000 (195 MHz, 16 proc)			3146	6240
SGI Origin 2000 (195 MHz, 8 proc)			2182	3120
SGI Origin 2000 (195 MHz, 4 proc)			1292	1560
SGI Origin 2000 (195 MHz, 2 proc)			667	780
SGI Origin 2000 (195MHz,1proc)	-n32 -mips4 -Ofast=ip27 -TENV:X=4 -LNO:blocking=off:ou_max=6:pf2=0	114	344	390
Sun UltraSparc II 250 MHz	-fast -native -xsafe=mem -dalign -xO5 -xarch=v8plusa -xchip=ultra	114	117	500
Fujitsu VP2100/10 (4 ns)	FORTRAN77 EX/VP V11L10	112	445	500
Cray J916 (2 proc. 10 ns)	CF77 6.0 -Zp -Wd-e68	111	380	400
Sun Ultra HPC 6000(250 MHz,30 p)			4755	15000
Sun Ultra HPC 6000(250 MHz,24 p)			4389	12000
Sun Ultra HPC 6000(250 MHz,16 p)			3493	8000
Sun Ultra HPC 6000(250 MHz,14 p)			3112	7000
Sun Ultra HPC 6000(250 MHz, 8 p)			2038	4000
Sun Ultra HPC 6000(250 MHz, 6 p)			1607	3000
Sun Ultra HPC 6000(250 MHz, 4 p)			1126	2000
Sun Ultra HPC 6000 (250 MHz,1MB L2)	-fast -native -xarch=v8plusa -xsafe=mem -dalign -libmil -xO5 -fsimple=2 -stackvar -xarch=v8plusa -xcache=16/32/1:512/64/1 -xchip=ultra -xdepend -xlibmil -xlibmopt -xsafe=mem -Qoption cg -Qms_pipe+float_loop_ld=16 -xcrossfile	110		500
Cray J932 (2 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68	109	376	400
Hitachi S-820/80 (4 ns)	FORT77/HAP V23-0C	107		3000
Cray J916 (1 proc. 10 ns)	CF77 6.0 -Zp -Wd-e68	106	203	200
Cray J932 (1 proc. 10 ns)	cf77 (6.0) -Zp -Wd-68	104	202	200
Dell Dimension XPS T500 500 MHz	Intel v5.0 -O3 -G6 -QxM -Qip -Qauto -Qrcd	104		500

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Cray 2S/8-128 (8 proc. 4.1 ns)	CF77 4.0 -Zp -Wd-e68	102	2171	3902
IBM POWER2 model 58H(55 MHz)	-O-Pv-Wp-ea478-g1-qarch=pwrx	101	197	220
SGI POWER CHALLENGE (75 MHz,18 proc)			3227	5400
SGI POWER CHALLENGE (75 MHz,16 proc)			3033	4800
SGI POWER CHALLENGE (75 MHz,14 proc)			2775	4200
SGI POWER CHALLENGE (75 MHz,12 proc)			2499	3600
SGI POWER CHALLENGE (75 MHz,10 proc)			2167	3000
SGI POWER CHALLENGE (75 MHz,8 proc)			1818	2400
SGI POWER CHALLENGE (75 MHz,6 proc)			1421	1800
SGI POWER CHALLENGE (75 MHz,4 proc)			993	1200
SGI POWER CHALLENGE (75 MHz,2 proc)			505	600
SGI POWER CHALLENGE (75 MHz,1 proc)	-non_shared -OPT: IEEE_arithmetic=3:roundoff=3 -TENV:X=4 -col120 -WK,-ur=12, -ur2=200 -WK,-so=3,-ro=3,-o=5 -WK,-inline=daxpy:dscal:idamax -SWP:max_pair_candidates=2 -SWP:strict_ivdep=false	104	261	300
Convex C4/XA-1(1 proc.)(7.41 ns)	fc9.0.0.5 -tm c4 -O2 -is .	99	705	810
Intel Pentium II Xeon (450 MHz)	g77 -funroll-all-loops -O3	98	295	450
ETA 10-G (1 proc. 7 ns)	ETAV/FTN200	93	496	571
Convex C-3880 (8 proc.) (16.7 ns)	fc7.0 -tm c38 -O3 -ep 8 -ds -is .	86	795	960
IBM ES/9000-982 VF(8 proc 7.1ns)	VAST-2/VS Fortran V2R5		2278	4507
IBM ES/9000-972 VF(7 proc 7.1ns)	VAST-2/VS Fortran V2R5		2072	3944
IBM ES/9000-962 VF(6 proc 7.1ns)	VAST-2/VS Fortran V2R5		1923	3380
IBM ES/9000-952 VF(5 proc 7.1ns)	VAST-2/VS Fortran V2R5		1681	2817
IBM ES/9000-942 VF(4 proc 7.1ns)	VAST-2/VS Fortran V2R5		1377	2254
IBM ES/9000-831 VF(3 proc 7.1ns)	VAST-2/VS Fortran V2R5		1082	1690
IBM ES/9000-821 VF(2 proc 7.1ns)	VAST-2/VS Fortran V2R5		767	1127
IBM ES/9000-711 VF(1 proc 7.1ns)	VAST-2/VS Fortran V2R5	86	422	563
Dell Dimension XPS T500(500 MHz) Pentium III	Win98SE Intel Fortran -O3 -G6 -QaxK -Qipo	86		500
Intel Pentium III 550 MHz	g77 -O3 -fomit-frame-pointer -funroll-loops	86	325	550
HALstation 300 model 350(118MHz)	-Kfast -Keval -KGREG -Kgs -KV8PLUS -X7 -Kpreex -Kpreload -Kfuse -x FLDFLAGS = -dn	85	177	236
Dell Pentium III 550 MHz	f77 -O3	80		550
SUN-Ultra 1 mod. 170	f77 v4.0 -fast -O4	76		
Convex C-3840 (4 proc.) (16.7 ns)	fc7.0 -tm c38 -O3 -ep 4 -ds -is .	75	425	480
Intel Pentium III 550 MHz	g77 -O3	74	325	550

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
HALstation 300 model 330(101MHz)	-Kfast -Keval -KGREG -Kgs -KV8PLUS -X7 -Kpreex -Kpreload -Kfuse -x FLDFLAGS = -dn	72	153	202
SGI CHALLENGE/Onyx (6.6ns, 32 proc)			539	2400
SGI CHALLENGE/Onyx (6.6ns, 28 proc)			531	2100
SGI CHALLENGE/Onyx (6.6ns, 24 proc)			499	1800
SGI CHALLENGE/Onyx (6.6ns, 20 proc)			474	1500
SGI CHALLENGE/Onyx (6.6ns, 18 proc)			458	1350
SGI CHALLENGE/Onyx (6.6ns, 16 proc)			431	1200
SGI CHALLENGE/Onyx (6.6ns, 14 proc)			393	1050
SGI CHALLENGE/Onyx (6.6ns, 12 proc)			374	900
SGI CHALLENGE/Onyx (6.6ns, 10 proc)			338	750
SGI CHALLENGE/Onyx (6.6ns, 8 proc)	IRIX 5.2,f77,-O2-mips2-Wo, -loopunroll,8-Olimit2000-Wf -dchacheopt-jmpopt-non_shared -pfa keep-WK, -WK, -ipa=daxpy:saxpy,-ur=1,-mc=100	73	311	600
Convex C-3830 (3 proc.) (16.7 ns)	fc7.0 -tm c38 -O3 -ep 3 -ds -is .	71	327	360
Sun UltraSPARC 1(24 proc)167MHz			3566	8000
Sun UltraSPARC 1(20 proc)167MHz			3170	6667
Sun UltraSPARC 1(16 proc)167MHz			2761	5333
Sun UltraSPARC 1(12 proc)167MHz			2238	4000
Sun UltraSPARC 1(8 proc)167MHz			1607	2667
Sun UltraSPARC 1(4 proc)167MHz			871	1333
Sun UltraSPARC 1(2 proc)167MHz			456	667
Sun UltraSPARC 1(1 proc)167MHz	-V -fast -native -dalign -libmil -xO4 -xsafe=3Dmem -Qoption cg=20 -Qms_pipe+float_loop_ld=3D16 -onetrip -xcrossfile	70	237	333
SGI CHALLENGE/Onyx (6.6ns, 6 proc)	IRIX 5.2,f77,-O2-mips2-Wo, -loopunroll,8-Olimit2000-Wf -dchacheopt-jmpopt-non_shared -pfa keep-WK, -WK, -ipa=daxpy:saxpy,-ur=1,-mc=100	69		450
Intel Pentium II, 333MHz	g77 -O3 -funroll-all-loops	69		333
AMD K6-2, 500 MHz	g77 -march=k6 -O3 -fomit-frame-pointer -funroll-loops	69	100	250
Convex SPP-1600(8 proc) 120 MHz			934	1920
Convex SPP-1200(8 proc) 120 MHz			656	1920
Convex SPP-1600(7 proc) 120 MHz			860	1680
Convex SPP-1600(6 proc) 120 MHz			722	1440

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Convex SPP-1200(6 proc) 120 MHz			530	1440
Convex SPP-1600(5 proc) 120 MHz			633	1200
Convex SPP-1600(4 proc) 120 MHz			518	960
Convex SPP-1200(4 proc) 120 MHz			383	960
Convex SPP-1600(3 proc) 120 MHz			415	720
Convex SPP-1600(2 proc) 120 MHz			290	480
Convex SPP-1200(2 proc) 120 MHz			213	480
Convex SPP-1600(1 proc) 120 MHz	fc9.2.1 fc -is	65	195	240
Convex SPP-1200(1 proc) 120 MHz	fc9.2.1 fc -is	65	123	240
Dell Pentium III 450 MHz	f77 -O3	65		450
SUN-Ultra 1 mod. 140	f77 v4.0 -fast -O4	63		
Convex C-3820 (2 proc.) (16.7 ns)	fc7.0 -tm c38 -O3 -ep 2 -ds -is .	62	222	240
AMD K6-II (350 MHz) BCM-1541 ATX	g77 -O3 -o g77ldst	64		350
Cray-2/4-256 (4 proc. 4.1 ns)	cf77 3.0	62	1226	1951
ETA 10-E (1 proc. 10.5 ns)	ETAV/FTN200	62	334	381
Gateway 2000 G6-200 PentiumPro	MS Fortran NT /G5 /Oxb2	62		200
IBM ES/9000-900 VF(6 proc. 9 ns)	VAST-2/VS Fortran V2R4		1457	2664
IBM ES/9000-860 VF(5 proc. 9 ns)	VAST-2/VS Fortran V2R4		1210	2220
IBM ES/9000-820 VF(4 proc. 9 ns)	VAST-2/VS Fortran V2R4		1003	1776
IBM ES/9000-740 VF(3 proc. 9 ns)	VAST-2/VS Fortran V2R4		775	1332
IBM ES/9000-640 VF(2 proc. 9 ns)	VAST-2/VS Fortran V2R4		539	888
IBM ES/9000-660 VF(2 proc. 9 ns)	VAST-2/VS Fortran V2R4		535	888
IBM ES/9000-520 VF(1 proc. 9 ns)	VAST-2/VS Fortran V2R4	60	338	444
SGI CHALLENGE/Onyx (6.6ns, 4 proc)	IRIX 5.2,f77,-O2-mips2-Wo, -loopunroll,8-Olimit2000-Wf -dchacheopt-jmpopt-non_shared -pfa keep-WK, -WK, -ipa=daxpy:saxpy,-ur=1,-mc=100	58	178	300
Cray X-MP/14se (10 ns)	cf77 3.0	53	184	210
DEC 7000-760 (6 proc) 3.64 ns			962	1650
DEC 7000-740 (4 proc) 3.64 ns			693	1100
DEC 7000-720 (2 proc) 3.64 ns			361	550
DEC 7000-710 (1 proc) 3.64 ns	3.6 -O5 -fast	53	208	275
IBM RS/6000-390 (66.5 MHz)	v3.1.1 xlf -Pv -Wp,-fz,-me,-ew -O3 -Q -qstrict -qarch=pwr-qtune =pwrx -qhot -qhsflt -qnosave	53	181	266
DEC 2100 4/275 A500MP(4 proc)			625	1100
DEC 2100 4/275 A500MP(2 proc)			348	550
DEC 2100 4/275 A500MP(1 proc)	3.6 -O5 -fast	52	208	275

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
DEC 3000-900 (1 proc) 3.64 ns	3.6 -O5 -fast	52	193	275
AMD K6-II 500 Mhz	g77 -O3	51		500
Convex SPP-1000(15 procs)100MHz			965	3000
Convex SPP-1000(12 procs)100MHz			916	2400
Convex SPP-1000(8 procs)100 MHz			751	1600
Convex SPP-1000(4 procs)100 MHz			442	800
Convex SPP-1000(2 procs)100 MHz			255	400
Convex SPP-1000(1 proc) 100 MHz	fc9.2.1 fc -is	48	123	200
Cray-2/4-256 (2 proc. 4.1 ns)	cf77 3.0	48	709	976
IBM ES/9000-711 (1 proc 7.1ns)	VAST-2/VS Fortran V2R5	48		
DEC 3000-700 (1 proc) 4.44 ns	3.6 -O5 -fast	45	164	225
DEC 400 4/233 (1 proc) 4.3 ns	3.6 -O5 -fast	45	138	233
Compaq/DEC Alpha 21164 EV56 533 MHz	g77 -O3	45	501	1066
Convex C-3810 (1 proc.) (16.7 ns)	fc7.0 -tm c38 -O2 -is .	44	113	120
DEC 7000-660 (6 procs) 5.0 ns			755	1200
DEC 7000-650 (5 procs) 5.0 ns			641	1000
DEC 7000-640 (4 procs) 5.0 ns			538	800
DEC 7000-630 (3 procs) 5.0 ns			413	600
DEC 7000-620 (2 procs) 5.0 ns			279	400
DEC 7000-610 (1 proc) 5.0 ns	1.3 -O5 -fast	44	156	200
DEC 3000-800 Alpha AXP 5.0 ns	1.3 -O5 -fast	44	145	200
DEC 2100-A500MP(4 procs)5.25 ns	1.3 -O5 -fast		358	760
DEC 2100-A500MP(3 procs)5.25 ns	1.3 -O5 -fast		293	570
DEC 2100-A500MP(2 procs)5.25 ns	1.3 -O5 -fast		209	380
DEC 2100-A500MP(1 proc) 5.25 ns	1.3 -O5 -fast	43	129	190
DEC 10000-660 Alpha AXP(6 proc)			751	1200
DEC 10000-650 Alpha AXP(5 proc)			639	1000
DEC 10000-640 Alpha AXP(4 proc)			523	800
DEC 10000-630 Alpha AXP(3 proc)			403	600
DEC 10000-620 Alpha AXP(2 proc)			273	400
DEC 10000-610 Alpha AXP 200 MHz	3.2 inl=daxpy,ur=4,ur2=240	43	155	200
NEC SX-2 (6 ns)	FORTRAN 77/SX	43	885	1300
Cray Y-MP EL (4 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	41	345	532
HP 9000/735 (99 MHz)	+OP3 -Wl,-aarchive -WP,-nv -w, ConvexMLIB 1.2	41	120	198
Compaq Proliant 5000 200 MHz	MS Power Stat. 4.0 Full Opt	40		200
Cray Y-MP EL98 (8 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	40	567	1068

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Cray Y-MP EL98 (4 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	40	357	534
Cray Y-MP EL94 (4 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	40	331	532
Cray S-MP/11v2 (1 proc. 30 ns)	uf77 5.1.2 vec=collapse pi+	39	206	267
Cray Y-MP EL94 (2 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	39	190	266
Cray Y-MP EL (2 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	39	191	266
DEC 4000-720 (2 procs) 5.25 ns			235	380
DEC 4000-710 (1 procs) 5.25 ns	1.3 -O5 -fast	39	143	190
DEC 1000 4/200 (5 ns)	3.6 -O5 -fast	39	147	200
HP9000/J200 (100 MHz)	+O3 +DC7200 +Odataprefetch	38		
Cray-2/4-256 (1 proc. 4.1 ns)	cf77 3.0	38	360	488
IBM RISC Sys/6000-580 (62.5MHz)	v2.3 xlf -O -P -Wp,-ea478	38	104	125
IBM RISC Sys/6000-980 (62.5MHz)	v2.3 xlf -O -P -Wp,-ea478	38	104	125
IBM ES/9000-520 (1 proc. 9 ns)	VAST-2/VS Fortran V2R4	38		
IBM ES/9000-820 (1 proc. 9 ns)	VAST-2/VS Fortran V2R4	38		
SGI CHALLENGE/Onyx (6.6ns, 2 proc)	IRIX 5.2,f77,-O2-mips2-Wo, -loopunroll,8-Olimit2000-Wf -dchacheopt-jmpopt-non_shared -pfa keep-WK, -WK, -ipa=daxpy:saxpy,-ur=1,-mc=100	38	93.5	150
DEC 4000-610 Alpha AXP(160 MHz)	3.2 inl=daxpy,ur=4,ur2=240	36	114	160
Pentium Pro 200 Mhz	Solaris 2.5 GNU F77 v0.5.5	38		200
NEC SX-1	FORTRAN 77/SX	36	422	650
Cray Y-MP EL98 (2 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	35	192	267
Apple Macintosh 9500/233	MF -O4 -Asched=2,targ=604	34		
Apple Macintosh 6500/275	MF -O4 -Asched=2,targ=604	20		
Convex C-3440 (4 proc.)	fc7.0 fc -O3 -ep 4 -ds -is .	34	172	200
Cray Y-MP EL98 (1 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	34	107	133
ETA 10-Q (1 proc. 19 ns)	ETAV/FTN200	34	185	210
Cray Y-MP EL94 (1 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	34	107	133
Cray Y-MP EL (1 proc. 30 ns)	CF77 5.0 -Zp -Wd-e68	34	107	133
DEC 3000-600 Alpha AXP 5.7 ns	1.3 -O5 -fast	34	129	180
Cray S-MP/MCP784(84 proc. 25 ns)			742	3360
Cray S-MP/MCP756(56 proc. 25 ns)			678	2240
Cray S-MP/MCP728(28 proc. 25 ns)			508	1120
Cray S-MP/MCP707 (7 proc. 25 ns)	MCP Release 2.2	33	194	280
DEC 200 4/166 (1 proc) 6 ns	3.6 -O5 -fast	33	100	167
FPS 510S MCP784 (84 proc. 25 ns)			548	3360
FPS 510S MCP756 (56 proc. 25 ns)			513	2240
FPS 510S MCP728 (28 proc. 25 ns)			414	1120
FPS 510S MCP707 (7 proc. 25 ns)	pgf77 -O4 -Minline	33	184	280

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
CDC Cyber 2000V	Fortran V2	32		
Convex C-3430 (3 proc.)	fc7.0 fc -O3 -ep 3 -ds -is .	32	132	150
Macintosh 7300/200MHz	4.4, Absoft Corp.-c -O -o	32		200
NEC SX-1E	FORTRAN 77/SX	32	221	325
SGI Indigo2 (R4400/200MHz)	-mips2 -Olimit 3000 -Wo, -loopunroll,8 -Wf,-dcacheopt -Wf,-dcacheoptx -O3 -non_shared	32		
Alliant FX/2800-200 (14 proc)	fortran 1.1.27 -O -inline	31	325	560
IBM RISC Sys/6000-970 (50 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	31	84	100
IBM RS/6000 Cluster(8 proc 62.5 MHz)			269	1000
IBM RS/6000 Cluster(4 proc 62.5 MHz)			206	500
IBM RS/6000 Cluster(2 proc 62.5 MHz)			144	250
IBM RS/6000 Cluster(8 proc 50 MHz)			194	800
IBM RS/6000 Cluster(6 proc 50 MHz)			174	600
IBM RS/6000 Cluster(4 proc 50 MHz)			152	400
IBM RS/6000 Cluster(2 proc 50 MHz)			111	200
IBM RISC Sys/6000-560 (50 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	31	84	100
IBM ES/9000-742 VF(4 proc 11ns)	VAST-2/VS Fortran V2R5		441	752
IBM ES/9000-732 VF(3 proc 11ns)	VAST-2/VS Fortran V2R5		352	545
IBM ES/9000-622 VF(2 proc 11ns)	VAST-2/VS Fortran V2R5		244	364
IBM ES/9000-621 VF(2 proc 11ns)	VAST-2/VS Fortran V2R5		244	364
IBM ES/9000-521 VF(2 proc 11ns)	VAST-2/VS Fortran V2R5		185	364
IBM ES/9000-511 VF(1 proc 11ns)	VAST-2/VS Fortran V2R5	30	130	182
DEC 3000-500 Alpha AXP(150 MHz)	3.2 inl=daxpy,ur=4,ur2=240	30	107	150
Hitachi SR2201(1 proc 150 MHz)	f90 PVEC,OPT(0(S),FOLD(2))	30	248	300
SGI CHALLENGES 200Mhz R4400SC	IRIX 5.3 f77 -O4 -mips2	30		
Alliant FX/2800-200 (12 proc)	fortran 1.1.27 -O -inline	29	290	480
HP 9000/715 (75 MHz)	HP-UX f77 +OP4	29		
IBM 9672-R12	VAST-2/VS Fortran 2.5	29		83
Sun Sparc 20 90 MHz, (1 proc)	Sun 5.3 -fast -unroll=4 -O4	29		
Intel Pentium 166 MHz	ifc -O3 -ip -align	28.37	79.37	166
Alliant FX/2800-200 (10 proc)	fortran 1.1.27 -O -inline	27	250	400
ETA 10-P (1 proc. 24 ns)	ETAV/FTN200	27	146	167
Convex C-3420 (2 proc.)	fc7.0 fc -O3 -ep 2 -ds -is .	27	90	100
Cray-1S (12.5 ns)	cf77 2.1	27	110	160
Convex C-3240 (4 proc.)	fc -O3 -ep 2 -uo -pp=fcpp1 -is .	26	171	200
Convex C-240 (4 proc.)	6.1 -O3 -ep2 -uo -pp=fcpp1 -is .	26	166	200
Convex C-3230 (3 proc.)	fc -O3 -ep 2 -uo -pp=fcpp1 -is .	26	132	150

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Convex C-230 (3 proc.)	6.1 -O3 -ep2 -uo -pp=fcpp1 -is .	26	128	150
DEC 2000-300 Alpha AXP 6.7 ns	1.3 -O5 -fast	26	88	150
DEC 3000-400 Alpha AXP(133 MHz)	3.2 inl=daxpy,ur=4,ur2=240	26	90	133
IBM RISC Sys/6000-950 (42 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	26	70	84
IBM RISC Sys/6000-550 (42 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	26	70	84
IBM RISC Sys/6000-375(62.5 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	26	90	125
IBM RISC Sys/6000-370(62.5 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	26	90	125
SGI CHALLENGE/Onyx (6.6ns, 1 proc)	IRIX 5.2,f77,-O2-mips2-Wo, -loopunroll,8-Olimit2000-Wf -dchacheopt-jmpopt-non_shared -pfa keep-WK, -WK, -ipa=daxpy:saxpy,-ur=1,-mc=100	26	48.4	75
Alliant FX/2800 210 (1 proc)	fortran 1.3.02 -Ovg -inline	25	34	50
Alliant FX/2800-200 (8 proc)	fortran 1.1.27 -O -inline	25	207	320
NAS AS/EX 100 VPF (4 proc)			320	484
NAS AS/EX 90 VPF (3 proc)			251	363
NAS AS/EX 80 VPF (2 proc)			173	242
NAS AS/EX 60 VPF	VAST-2/VS 2.3.0 opt=3	25	94	121
HP 9000/750 (66 MHz)	+OP3 -Wl,-aarchive -WP,-nv -w	24	47	66
HP 9000/730 (66 MHz)	+OP3 -Wl,-aarchive -WP,-nv -w	24	49	66
IBM ES/9000 Model 480 VF	VAST-2/VS Fortran V2R4		180	266
IBM ES/9000-340 VF (14.5 ns)	VAST-2/VS Fortran V2R4	23		138
IBM ES/9000-411 VF(1 proc 11ns)	VAST-2/VS Fortran V2R5	23	99	182
Meiko CS2 (64 proc)			652	11520
Meiko CS2 (32 proc)			649	5760
Meiko CS2 (16 proc)			530	2880
Meiko CS2 (8 proc)			420	1440
Meiko CS2 (4 proc)			289	720
Meiko CS2 (2 proc)			169	360
Meiko CS2 (1 proc)	-dalign -O5 -XT=ss10h,unroll=1	24	97	180
Fujitsu M1800/20	EX V10L20 frt -Of -Ne	23		
Intel Pentium 166 MHz	g77 -march=pentium -O3 -fomit-frame-pointer -funroll-loops	23	78	166
Sun Sparc 10-52 (1 proc)	Sun 3.0 -fast -O4 -unroll=4 -Bstatic	23		
DEC VAX 9000 420VP(2 proc 16 ns)	HPO V1.3-163V, DXML		155	250
DEC VAX 9000 410VP(1 proc 16 ns)	HPO V1.3-163V, DXML	22	89	125
IBM ES/9000-610 VF (4 proc 15 ns)	VAST-2/VS Fortran V2R4		335	532
IBM ES/9000-570 VF (3 proc 15 ns)	VAST-2/VS Fortran V2R4		252	399
Apple Macintosh 9500/132	MF77 -O4 -Ashed=2,target=604	22		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
IBM ES/9000-490 VF (2 proc 15 ns)	VAST-2/VS Fortran V2R4		171	266
IBM ES/9000-320 VF (1 proc 15 ns)	VAST-2/VS Fortran V2R4	22	91	133
IBM RISC Sys/6000-570 (50 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	22	73	100
IBM RISC Sys/6000-365 (50 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	22	73	100
IBM RISC Sys/6000-360 (50 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	22	73	100
Multiflow TRACE 28/300	Fortran 2.2.1	22	69	123
Convex C-3220 (2 proc.)	fc -O3 -ep 2 -uo -pp=fcpp1 -is .	22	89	100
Convex C-220 (2 proc.)	6.1 -O3 -ep2 -uo -pp=fcpp1 -is .	22	87	100
Alliant FX/2800-200 (6 proc)	fortran 1.1.27 -O -inline	21	148	240
Siemens VP400-EX (7 ns)	Fortran 77/VP V10L30	21	794	1714
IBM ES/9221-211 (16 ns)	VAST-2/VS Fortran 2.5	21		
Apple Macintosh 6500/275	MF -O4 -Asched=2,targ=604	20		
Apple Power Mac 8500/120	Absoft Power PC v4.1 -O -U	20		
FPS Model 522	F77 4.2	20	105	133
Fujitsu VP-400	Fortran 77 V10L30	20		1142
IBM RISC Sys/6000-530H(33 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	20	55	66
IBM RS/6000-C10(601 - 80 MHz)	v3.1.1 xlf -Pv -Wp,-fz,-me, -ew -O3 -qarch=ppc -qhot -qhsflt -qnosave -qnofold	20	63	80
IBM ES/9672-R11 (16 ns)	VAST-2/VS Fortran 2.5	20		
Siemens VP200-EX (7 ns)	Fortran 77 V10L30	20	472	857
Amdahl 1400	77/VP V10L20	19	521	1142
Amdahl 1200	77/VP V10L20	19	424	571
Apple Power Mac 9500/132	Absoft Power PC v4.1 -O -U	19		
Convex C-3410 (1 proc.)	fc7.0 fc -O2 -is .	19	47	50
Gateway 2000 P5-133	MS PS 32 NT /G5 /Oxb2	19		
IBM ES/9000 Model 260 VF (15 ns)	VAST-2/VS Fortran V2R4	19	78	133
IBM RISC Sys/6000-550L(42 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	19	61	82
IBM RISC Sys/6000-540 (30 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	19	50	60
IBM RISC Sys/6000-355 (42 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	19	61	84
IBM RISC Sys/6000-350 (42 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	19	61	84
IBM RISC Sys/6000-34H (42 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	19	61	84
IBM ES/9000-311 VF(1 proc 11ns)	VAST-2/VS Fortran V2R5	19	82	182
Cray S-MP/11 (1 proc. 30 ns)	uf77 5.1.2 -Oc a2	18	60	67
Compaq Deskpro 4000 166 MHz	MS Power Stat. 4.0 Full Opt	18		166
Fujitsu VP-200	Fortran 77	18	422	533
HP 9000/720 (50 MHz)	HP-UX 8.05 f77 +OP4 +O3	18	36	50
IBM ES/9221-201 (16 ns)	VAST-2/VS Fortran 2.5	18		
NAS AS/EX 50 VPF	VAST-2/VS 2.3.0	18	82	121
SGI 4D/480(8 proc) 40MHz	f77 -O2 -mp	18	71	128

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Siemens VP100-EX (7 ns)	Fortran 77/VP V10L30	18	254	428
Sun 670MP Ross Hypersparc(55Mhz)	-cg89 -dalign -libmil -O4	18		
Pentium 133 MHz	g77 -march=pentium -O3 -fomit-frame-pointer -funroll-loops	17.61	60.65	133
Apple PowerMacintosh 8100/100	Motorola MF77 -O4	17		
Apple Power Mac 6500/275	Absoft f77 v4.4 -O	17		
Alliant FX/2800-200 (4 proc)	fortran 1.1.27 -O -inline	17	94	160
Amdahl 1100	77/VP V10L20	17	248	285
CDC CYBER 205 (4-pipe)	FTN	17	195	400
CDC CYBER 205 (2-pipe)	FTN	17	113	200
Convex C-3210 (1 proc.)	fc -O2 -uo -pp=fcpp1 -is .	17	44	50
Convex C-210 (1 proc.)	6.1 -O2 -uo -pp=fcpp1 -is .	17	44	50
Cray XMS (55 ns)	cf77 5.0 -Zp -Wd-e68	17	34	36
Hitachi S-810/20	FORT77/HAP	17		840
IBM ES/9000 Model 210 VF (15 ns)	VAST-2/VS Fortran V2R4	17	72	133
Siemens VP50-EX (7 ns)	Fortran 77/VP V10L30	17	238	285
Multiflow TRACE 14/300	Fortran 2.2.1	17	42	63
Amdahl 500	77/VP V10L20	16	133	142
Fujitsu VP-100	Fortran 77	16		267
Hitachi M680H/vector	Fort 77 E2 V04-0I	16		
Hitachi S-810/10	HAP V21.00	16		315
IBM 3090/600J VF (6 proc, 14.5 ns)			540	828
IBM 3090/500J VF (5 proc, 14.5 ns)			458	690
IBM 3090/400J VF (4 proc, 14.5 ns)			370	552
IBM 3090/380J VF (3 proc, 14.5 ns)			282	414
IBM 3090/300J VF (3 proc, 14.5 ns)			284	414
IBM 3090/280J VF (2 proc, 14.5 ns)			191	276
IBM 3090/200J VF (2 proc, 14.5 ns)			192	276
IBM 3090/180J VF (1 proc, 14.5 ns)	VS Fortran V2R3	16	97	138
PowerPC 601/100 MHz	LS Fortran 1.5 prerelease	16		
SGI Crimson(1 proc 50 MHz R4000)	-O2 -mips2 -G 8192	16	32	50
SGI 4D/380(8 proc) 33MHz	f77 -O2 -mp	16	60	106
SGI Indigo2 Extreme(R4000/100MHz)	-O2 -mips2 -G 8192	15		
FPS Model 511	F77 4.2	15	56	67
Hitachi M680H	Fort 77 E2 V04-0I	15		
IBM RISC Sys/6000-930 (25 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	15	42	50
IBM RISC Sys/6000-530 (25 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	15	42	50
IBM RISC Sys/6000-340 (33 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	15	49	66

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
IBM ES/9000-511 (1 proc 11ns)	VAST-2/VS Fortran V2R5	15		
Kendall Square (32 proc)			513	1280
Kendall Square (16 proc)			307	640
Kendall Square (8 proc)			146	320
Kendall Square (4 proc)			47	160
Kendall Square (1 proc)	ksrf77 -O2 -r8 -inline_auto	15	31	40
NAS AS/EX 60	Fortran	15		40
SGI 4D/440(4 proc) 40MHz	f77 -O2 -mp	15	42	64
Siemens H120F	Fortran 77	15		
Apple Power Mac 5500/250	Absoft f77 v4.4 -O	14		
Power Computing 100/601/100	Absoft f77 Power PC v4.1	14		
Cydrome CYDRA 5	Fortran 77 Rel 2.4.1	14		25
Fujitsu VP-50	Fortran 77	14		133
IBM ES/9000 Model 190 VF(15 ns)	VAST-2/VS Fortran V2R4	14	60	133
IBM ES/9221-191 (16 ns)	VAST-2/VS Fortran 2.5	14		
Apple Power Mac 7100/80	Absoft f77 Power PC v4.1	13		
DELL XMT5133 Pentium 133MHz	PS 32 NT V 1.0 /G5 /Oxb2	14		
IBM POWERPC 250 (66 MHz)	-O-Pv-Wp-ea478-g1-qarch=pwrx	13		66
IBM 3090/180E VF	VS 2.1.1 opt=3	13	71	116
SGI 4D/340(4 proc) 33MHz	f77 -O2 -mp	13	36	53
Apple Power Mac 7500/100	Absoft f77 Power PC v4.1	12		
Apple Power Mac 8100/80	Absoft f77 Power PC v4.1	12		
CDC CYBER 990E	FTN V2 VL=HIGH	12		
Cray-1S (12.5 ns, 1983 run)	CFT 1.12	12	110	160
Gateway 2000 P5-100XL	MS PS 32 /G5 /Ox /D "NDEBUG"	12		
IBM 3090/180 VF	VS Fortran V2	12	65	108
IBM RISC Sys/6000-520H(25 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	12	37	50
IBM RISC Sys/6000-320H(25 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	12	37	50
SGI Indigo 4000 50MHz	-O2 -mips2 -G 8192 -sopt	12		
Stardent 3040	3.0 -inline -nmax=300	12	77	128
Stardent 3030	3.0 -inline -nmax=300	12	63	96
Stardent 2040 (Stellar GS2000)	f77 -O3 -is R2.1	12		40
Stardent 1040 (Stellar GS1000)	f77 -O3 -is -re R2.0	12		40
CDC 4680InfoServer (60 MHz)	f77 2.20 -O3 -mips2 -Wb,-r6000	11		
Cray S-MP/MCP101 (1 proc. 25 ns)	MCP Release 2.2	11	31	40
FPS 510S MCP101 (1 proc. 25 ns)	pgf77 -O4	11	30	40

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
IBM ES/9000 Model 340	VAST-2/VS Fortran V2R4	11		
IBM ES/9000-411 (1 proc 11ns)	VAST-2/VS Fortran V2R5	11		
Meiko Comp. Surface (32 proc)			210	1280
Meiko Comp. Surface (16 proc)			187	640
Meiko Comp. Surface (8 proc)			147	320
Meiko Comp. Surface (4 proc)			98	160
Meiko Comp. Surface (2 proc)	-O4 -Mvect=smallvect		58	80
Meiko Comp. Surface (1 proc)	-Minline=daxpy	11	31	40
Gateway 2000 P5-90(90 MHz Pentium)	Windows NT /G5 /Oxb2	11		
SGI Power Series 50MHz R4000	-O2 -mips2 -G 8192 -sopt	11		
Stardent 3020	3.0 -inline -nmax=300	11	46	64
Sperry 1100/90 ext w/ISP	UCS level 2	11		
Multiflow TRACE 7/300	Fortran 2.2.1	11	22	31
Alliant FX/2800-200 (2 proc)	fortran 1.1.27 -O -inline	10	53	80
Alliant FX/80 (8 proc.)	-O -DAS -inline	10	69	188
IBM 3090/180J	VS Fortran V2R3	10		
Intel Paragon (1 proc)	-O4 -Mvect=smallvect -Minline=daxpy -Knoieee	10	34	50
MIPS RC6280 (60.0MHz)	f77 2.20 -O	10	16	24
MIPS RC6260 (60.0MHz)	f77 2.20 -O	10	16	24
Multiflow TRACE 14/200	Fortran 1.7	10		31
Stardent 3010	3.0 -inline -nmax=300	10	25	32
Stardent 1540 (Ardent Titan-4)			47	64
Stardent 1530 (Ardent Titan-3)			37	48
Stardent 1520 (Ardent Titan-2)	f77 1.0 -O3 -inline	10	25	32
Sun Sparc2000(50 MHz)(16 proc)			333	800
Sun Sparc2000(50 MHz)(12 proc)			295	600
Sun Sparc2000(50 MHz)(8 proc)			223	400
Sun Sparc2000(50 MHz)(1 proc)			28	50
Sun Sparc1000(50 MHz)(8 proc)			198	400
Sun Sparc1000(50 MHz)(4 proc)			107	200
Sun Sparc1000(50 MHz)(2 proc)			53	100
Sun Sparc1000(50 MHz)(1 proc)			25	50
Sun Sparc10/514(50 MHz)(4 proc)			98	200
Sun Sparc10/512(50 MHz)(2 proc)			57	100
Sun Sparc10/51(50 MHz)(1 proc)			27	50

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Sun Sparc10/402(40 MHz)(2 proc)			41	81
Sun Sparc10/40(40 MHz)(1 proc)	-fast -O4 -unroll=4 -Bstatic	10	23	40
Intel iPSC/Delta (512 proc)			446	20480
Intel iPSC/Delta (256 proc)			418	10240
Intel iPSC/Delta (128 proc)			393	5120
Intel iPSC/Delta (64 proc)			352	2560
Intel iPSC/Delta (32 proc)			304	1280
Intel iPSC/Delta (16 proc)			231	640
Intel iPSC/Delta (8 proc)			163	320
Intel iPSC/Delta (4 proc)			100	160
Intel iPSC/Delta (2 proc)	if77 -O4 -Mvect=smallvect		58	80
Intel iPSC/Delta (1 proc)	-Minline=daxpy -Knoieee	9.8	34	40
Intel iPSC/860 d7 (128 proc)			219	5120
Intel iPSC/860 d6 (64 proc)			208	2560
Intel iPSC/860 d5 (32 proc)			167	1280
Intel iPSC/860 d4 (16 proc)			131	640
Intel iPSC/860 d3 (8 proc)			103	320
Intel iPSC/860 d2 (4 proc)			75	160
Intel iPSC/860 d1 (2 proc)	if77 -O4 -Mvect=smallvect		52	80
Intel iPSC/860 d0 (1 proc)	-Minline=daxpy -Knoieee	9.8	34	40
SGI 4D/240(4 proc) 25MHz	f77 -O2 -mp	9.8	28	40
Apple Power Mac 6100/66	Absoft f77 Power PC v4.1	9.7		
Apple Power Macintosh 6100/60	Absoft v4.0 F77 -O	9.6		
IBM 3090/180S	VS Fortran 2.3.0	9.6	92	133
Alliant FX/80 (7 proc.)	-O -DAS -inline	9.5	63	165
CDC CYBER 4680	f77 2.11.2 o2	9.4		
IBM Power Vis. Sys. (32 proc.)			310	1280
IBM Power Vis. Sys. (1 proc.)	-O4 -Minline=daxpy	9.3		
NAS AS/EX 50	Fortran	9.3		28
Sun SPARCsystem 10/30 36MHz	f77 -O4 -cg89 -libmil -native	9.3		
SGI 4D/420(2 proc) 40MHz	f77 -O2 -mp	9.3	23	32
IBM RISC Sys/6000-520 (20 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	9.0	29	40
IBM RISC Sys/6000-320 (20 MHz)	v2.2.1 xlf -O -P -Wp,-ea478	9.0	29	40
IBM ES/9000-180 VF(15 ns)	VAST-2/VS Fortran V2R4	8.9	48	133
Solbourne 6/904 (Viking sparc)	f77 -O3 -cg89 -dalign	8.9		
Intel Pentium 75 MHz	g77 -march=pentium -O3	8.92	30.8	75

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
	-fomit-frame-pinter -funroll-loops			
IBM RISC Sys/6000-230 (45 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	8.8	19	90
DEC VAXvector 6000/520 (2 proc)	Fortran HPO V1.2	8.8	51	90
Comparex 8/92 (Fujitsu M382)	VS/FORTRAN 2.4.0	8.7		
DEC VAXstation 4000-90	V 5.2	8.7		
Apple Power Macintosh 7100/66	Absoft v4.0 F77 -O	8.6		
IBM ES/9000-311 (1 proc 11ns)	VAST-2/VS Fortran V2R5	8.6		
IBM ES/9000 Model 320	VAST-2/VS Fortran V2R4	8.5		
NAS AS/9160	VAST/VS 1.4.1 opt=3	8.3		
Alliant FX/80 (5 proc.)	-O -DAS -inline	8.1	49	118
IBM ES/9000 Model 260	VAST-2/VS Fortran V2R4	8.0		
SCS-40	CFT 1.13	8.0	17	45
SGI 4D/320(2 proc) 33MHz	f77 -O2 -mp	8.0	20	26
IBM ES/9000 Model 210	VAST-2/VS Fortran V2R4	7.7		
IBM ES/9000 Model 320	VS/FORTRAN V2R4	7.6		
IBM 3090/120E VF	VS 2.1.1 opt=3	7.5	54	108
IBM 3090/180E	VS 2.1.1 opt=3	7.4	71	116
Siemens 7890F	Fortran 77 V10.3	7.2		
Convex C-130	Fortran 4.0	7.2	31	36
Alliant FX/80 (4 proc.)	-O -DAS -inline	7.2	33	94
DEC VAXvector 6000/510 (1 proc)	Fortran HPO V1.2	7.0	28	45
CECpx XL 560 Pentium 60 MHz	10.5 wfc386 /l=dos4g /ox	7.2		
Sun SPARCsystem 10/41 40MHz	f77 -native -fast -O4 -Bstatic	7.0		
Stardent 1510 (Ardent Titan-1)	f77 1.0 -O2 -inline	6.9	13	16
IBM 3090/180	VS opt=3	6.8	65	108
Alliant FX/40 (4 proc.)	-O -DAS -inline	6.7	33	94
IBM RS/6000-N40(PowerPC601 50MHz)	xlf -O -P -Wp,-ea478	6.7		50
IBM RISC Sys/6000-M20 (33 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	6.6	14	66
IBM RISC Sys/6000-M2A (33 MHz)	v2.3.0 xlf -O -P -Wp,-ea478	6.6	14	66
IBM ES/9000 Model 190	VAST-2/VS Fortran V2R4	6.6		133
Convex C-120	fc 5.1	6.5	17	20
IBM RISC Sys/6000-220 (33 MHz)	v2.2.1 xlf -O -P -Wp,ea478	6.5	14	66
Alliant FX/4 (4 proc.)	-O -DAS -inline	6.4	21	47
Alliant FX/2800-200 (1 proc)	fortran 1.1.27 -O -inline	6.4	28	40
Apple PowerBook PB1400cs(133 MHz)	MF -O4 -Asched=2,targ=604	6.3		
Fujitsu M-380	Fortran 77, opt=3	6.3		
DEC VAX 6620	V5.5	6.2		
Multiflow TRACE 7/200	Fortran 1.4	6.0		15

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
SGI 4D/420(1 proc) 40MHz	f77 -O2	6.0	12	16
Apple Performa 6230CD/603/75	Absoft f77 Power PC v4.1	5.9		
Siemens 7890G	Fortran 77 V10.3 opt=4	5.9		
IBM 3090/150E	VS 2.1.1 opt=3	5.9	64	112
FPS-264 (M64/60)	F02 APFTN64 OPT=4	5.9	34	38
Alliant FX/80 (3 proc.)	-O -DAS -inline	5.9	32	71
SGI 4D/220(2 proc) 25MHz	f77 -O2 -mp	5.9	15	20
Apollo DN10000	f77,10.7	5.8		
DEC VAX 4000	opt=4, DEC Fortran V6.5	5.7		
HP9000/J200 (100 MHz)	fort77 -o	5.5		
Alliant FX/40 (3 proc.)	-O -DAS -inline	5.6	27	71
Gateway P5-60 (60 MHz Pentium)	F77L-EM32 5.01 /4 /Z1	5.4		
DEC 5900 RISC	Ultrix 4.1	5.3		
DEC 5000/240	Ultrix	5.3		
Gateway P5-60 (60 MHz Pentium)	77/32/mf/d1/warn/5/fp5/ot	5.3		
Alliant FX/4 (3 proc.)	-O -DAS -inline	5.1	17	35
CDC 4330-300 (33 MHz)	f77 2.20 -O3	5.1		
Number-Smasher 860 40MHz	NDP -vast-inline-on-OLM-fdiv	5.1		
VAXstation 4000-90	DEC FORTRAN V5.2	5.1		
DEC VAX 6000/610 (1 proc)	VMS V5.2	5.0		
Intel iPSC/2 d4/VX (16 proc)			39	
Intel iPSC/2 d5/VX (32 proc)			52	
SGI 4D/310(1 proc) 33MHz	f77 -O2	5.0	10	13
Honeywell DPS90	ES F77V 1.0	5.0		
Siemens 7890D	Fortran 77 V10.3	5.0		
IBM ES/9000 Model 180 (15 ns)	VAST-2/VS Fortran V2R4	4.9		
CDC CYBER 875	FTN 5 opt=3	4.8		
Number Smasher i860 40MHz	-on -OLM -fdiv -inline	4.7		40
CDC CYBER 176	FTN 5.1 opt=2	4.6		
MIPS RC3360 (33.3MHz)	f77 2.20 -O	4.5	11	13
Alliant FX/80 (2 proc.)	-O -DAS -inline	4.4	22	47
AMD 486DX5-133	f2c and gcc2.7.0	4.4		
Alliant FX/40 (2 proc.)	-O -DAS -inline	4.3	19	47
NAS AS/EX 30	VS 1.4.1 opt=3	4.3		
SGI 4D/35	f77 -O3	4.3		
Sun 4/600 MP	f77 1.4 -O3 -cg89 -dalign	4.3		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
IBM ES/9221-170 (16 ns)	VAST-2/VS Fortran 2.5	4.1		
Sun SPARCstation IPX	f77 1.4 -O3 -cg89 -dalign	4.1		
Sun 4/50 IPX	f77 1.4 -O3 -cg89 -dalign	4.1		
CDC CYBER 4360	f77 2.11.2 o2	4.0		
Sun SPARCstation 2	f77 1.4 -O3 -cg89 -dalign	4.0		
SGI Indigo 33MHz R3000	-O2 -G 8192 -sopt	4.0		
Amdahl 5860 HSFPF	H enhanced opt=3	3.9		
MIPS M/2000 (25.0MHz)	f77 2.20 -O	3.9	7.9	10
MIPS RC3260 (25.0MHz)	f77 2.20 -O	3.9	7.9	10
Alliant FX/4 (2 proc.)	-O -DAS -inline	3.8	12	24
SGI 4D/210(1 proc) 25MHz	f77 -O2	3.9	7.8	10
Amdahl 5860 HSFPF	VS opt=3	3.8		
CDC 4320	f77 2.20 opt=02	3.7		
DEC station 5000/200 (25 Mhz)	MIPS f77 2.0	3.7		
MIPS RS3230 (25.0MHz)	f77 2.20 -O	3.7	7.8	10
DEC VAXvector 6000/420 (2 proc)	Fortran HPO V1.0		43	90
DEC VAXvector 6000/410 (1 proc)	Fortran HPO V1.0	3.6	24	45
Sun 4/490	4.1.1 f77 -O3	3.6		
CDC 4330	f77 2.20 opt=02	3.5		
Apple Power Macintosh 6100/60	Absoft F77 SDK	3.4		
NAS 8093 w/HSA	VS 1.4.0 opt=3	3.5		
CDC 7600	FTN	3.3		
Sun Sparc ELC	-dalign -xcg89 -fsimple -O4	3.3		
CDC CYBER 960-31	NOS/VE 1.3.1 FTN 1.6	3.1		
Gould NP1	Fortran	3.1		
IBM 3090/120E	VS 2.1.1 opt=3	3.1	54	108
MIPS RC3240 (25.0MHz)	f77 2.20 -O	3.1	7.1	10
Tadpole SPARCbook 2	f77 -O	3.1		
CDC CYBER 4340	f77 2.11.2 o2	3.0		
Convex C-1/XP	Fortran 2.0	3.0		20
DEC VAX 6540	VMS 5.4-2	3.0		
FPS-264/20 (M64/50)	F02 APFTN64 OPT=4	3.0	17	
Harris Nighthawk 4802 (88100)	f77	3.0		
Convex C-1/XL	Fortran 1.6	2.9		20
IBM ES/9000 Model 150	VS Fortran V2R4	2.9		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
NAS AS/EX 25	VS 1.4.1 opt=3	2.9		
Solbourne 5/602	f77 (Sun) 1.2 -O3 -dalign	2.9		
Sun 4/330	f77 1.4 -O3 -dalign	2.7		
Sun 4/370	f77 1.3.1 -O3 -cg89 -dalign	2.7		
CDC CYBER 760	FTN 5, opt=3	2.6		
CyberPlus	CPFTN 1.1-07	2.6		
IBM 370/195	H enhanced opt=3	2.5		
Sun 4/330 SparcServer	f77 1.2, -O3 -dalign	2.5		
Alliant FX/80 (1 proc.)	-O -DAS -inline	2.4	12	24
Alliant FX/40 (1 proc.)	-O -DAS -inline	2.4	10	24
Gateway 2000 66 MHz 80486-DX2	F77L-EM32 5.01 /4 /Z1	2.4		
Apple Mac Quadra 840AV	Absoft -w -v -O -f -s -N40	2.3		
HP-APOLLO 9000/425e (68040)	f77 -O4 rev 10.3.5	2.3		
NAS AS/EX 20	VS 1.4.1 opt=3	2.2		
Fujitsu AP1000 (512 proc.)			610	2844
Fujitsu AP1000 (256 proc.)			333	1422
Fujitsu AP1000 (128 proc.)			193	711
Fujitsu AP1000 (64 proc.)			100	356
Fujitsu AP1000 (1 proc.)	Sun f77 1.3.1 -O3 -dalign	2.2	1.7	5.6
HP-APOLLO 9000/425t (68040)	f77 -O4 rev 10.3.4	2.2		
Alliant FX/4 (1 proc.)	-O -DAS -inline	2.1	6.3	12
CDC CYBER 175	FTN 5 opt=2	2.1		
CDC CYBER 180-860	NOS/VE OPT=HIGH	2.1		
FPS-M64/30	APFTN464 OPT=4	2.1	10	
IBM ES/9000 Model 130	VS Fortran V2R4	2.1		
IBM 3081 K (1 proc.)	H enhanced opt=3	2.1		
MIPS M120-5	UMIPS v.3 3.0 f771.31 -O	2.1	3.6	8.3
MIPS M/120 (16.7MHz)	f77 2.20 -O	2.1	4.8	6.7
Prism" 486-50 (50 MHz)	Salford v2.69 /optimise	2.1		
Tadpole SPARCbook (25 MHz)	f77 -O	2.1		
Apple Macintosh QUADRA 950	Absoft -w -v -O -f -s -N40	2.0		
CDC 7600	Local	2.0		
IBM 3081 K (1 proc.)	VS opt=3	2.0		
Culler PSC	CSD Fortran 3.21	2.0		5
FPS M64/35	APFTN464	2.0		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Micronics 486-50MHz EISA2	NDP Fortran 486: -on	2.0		
HP 425T (68040)		1.9		
CDC CYBER 175	FTN 5 opt=1	1.8		
HP 9000 Series 835	2.1 fc -O	1.8		
Sperry 1100/90	FTN opt=ZEO	1.8		
Sun SPARCstation 1+	f77 1.4 -O3 -cg89 -dalign	1.8		
ELXSI 6420 (5 proc.)			6.4	
ELXSI 6420 (3 proc.)			4.0	
ELXSI 6420 (2 proc.)			2.7	
ELXSI 6420 (1 proc.)	EMBOS 6.3 +opt+inline+vector	1.7	1.4	
FPS-164/364 (M64/40)	F02 APFTN64 OPT=4	1.7	9	
Honeywell DPS 8/88	FR7X	1.7		
IBM 3033	H enhanced opt=3	1.7		
IBM 3033	VS opt=3	1.7		
IBM 3081 D	VS opt=3	1.7		
MIPS RS2030 (16.7MHz)	f77 2.20 -O	1.7	4.7	6.7
Sperry 1100/90 ext	UFTN	1.7		
HP 9000 Series 850 w/fp	2.0 fc -O	1.6		
Amdahl 470 V/8	H enhanced opt=3	1.6		
CDC CYBER 170-750	FTN 5.1, opt=3	1.6		
CDC CYBER 180-850	NOS/VE OPT=HIGH	1.6		
DECstation 3100	V3.0/V1.31 -O	1.6		
DEC 5400	f77 -O3	1.6		
Amdahl 470 V/8	VS opt=3	1.5		
DEC VAXstation 4000-60	V 5.2	1.5		
MIPS M/1000 (15.0MHz)	f77 2.20 -O	1.5	3.7	6
NAS 8093	VS 1.4.0 opt=3	1.5		
Siemens 7570-P	For1 1.6A	1.5		
ALR 486/33 m-board, 256K cache	Lahey F77L3, v5.0 /Z1	1.4		
Apple Mac Quadra 700	Absoft -w -v -O -f -s -N40	1.4		
Compaq Deskpro 486/33l-120 w/487	Microway NDPF487 -O -OL -on	1.4		
NeXTCube	2.0 gcc 1.36 -O	1.4		
Sun SPARCstation 1	f77 1.3.1 -O3 -cg89 -dalign	1.4		
IBM 4381-23	VS Fortran 2.1.1 opt=3	1.3		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Compaq Deskpro 486/33l-120 w/487	Salford FTN77/ optimized	1.3		
Compaq Deskpro 486/33l-120 w/487	Watcom WFC386P /OL /OT	1.3		
ALR 486/33 m-board, 256K cache	Lahey F77L3, v5.0 /nZ1	1.2		
CDC 7600	CHAT, No opt	1.2		
CSPI MAP-6430	Fortran 1.5.35	1.2		
DEC VAX 6000/460 (6 proc)			8.4	15
DEC VAX 6000/450 (5 proc)			7.1	13
DEC VAX 6000/440 (4 proc)			5.8	10
DEC VAX 6000/430 (3 proc)			4.4	7.6
DEC VAX 6000/420 (2 proc)			3.0	5.1
DEC VAX 6000/410 (1 proc)	VMS V5.2	1.2	1.5	2.6
ELXSI 6420	Fortran 5.14 opt=10	1.2	1.4	
Gateway 2000/Micronics 486DX/33	f2c emx/gcc -O2 -m486	1.2		
Gateway Pentium (66HHz)	Lahey F77, 4.00	1.2		
IBM ES/9000 Model 120	VS Fortran V2R4	1.2		
IBM 370/168 Fast Mult	H Ext	1.2		
IBM 4381 90E	VS Fortran 2.1.1 opt=3	1.2		
IBM 4381-13	VS 1.4.0 opt=3	1.2		
MIPS M/800 (12.5MHz)	f77 1.31 -O	1.2		5
Prime P6350	f77 rev 20.2.b2 -opt	1.2		
Siemans 7580-E	BS2000	1.2		
Amdahl 470 V/6	H opt=2	1.1		
Compaq Deskpro 486/33l-120 w/487	Lahey F77L3 /Z1	1.1		
Sun 4/260	f77 -O sys4-beta2	1.1	1.1	3.3
ES1066 (1 proc. 80 ns Russian)	f77(like IBM VS1.4.1 OPT=3)	1.0		
Sony Playstation 2	gcc 2.95.2 Linux	.995		
CDC CYBER 180-840	NOS/VE OPT=HIGH	.99		
DEC VAX 8800 (4 proc)			4.9	
DEC VAX 8800 (3 proc)			3.7	
DEC VAX 8800 (2 proc)			2.5	
DEC VAX 8550/8700/8800	VMS v4.5	.99	1.3	
Solbourne	f77 -O	.98		
IBM 4381-22	VS Fortran 2.1.1 opt=3	.97		
IBM 4381 MG2	VS Fortran opt=3	.96		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
IBM 4381-12	VS Fortran 1.4.0 opt=3	.95		
ICL 3980 w/FPU	FORTRAN77 PLUS V10.02	.93		
IBM-486 33MHz	Microsoft 5.1	.94		
Siemens 7860E	Fortran 77 V10.3	.92		
Concurrent 3280XP	Fortran VII,Z 8.1	.87		
MIPS M800 w/R2010 FP	f77 1.10	.87		
Gould PN 9005	VTX/32 2.0 Fortran 77	.87		
VAXstation 3100-76	DEC FORTRAN V5.2	.85		
IBM 9370-90	VS Fortran 1.3.0 opt=3	.78		
nCUBE 2, 1024 proc			258	2409
nCUBE 2, 512 proc			204	1205
nCUBE 2, 256 proc			165	602
nCUBE 2, 128 proc			116	301
nCUBE 2, 64 proc			76.9	151
nCUBE 2, 32 proc			46.0	75
nCUBE 2, 16 proc			26.1	38
nCUBE 2, 8 proc			14.2	19
nCUBE 2, 4 proc			7.50	9.4
nCUBE 2, 2 proc			3.91	4.7
nCUBE 2, 1 proc	Fort77/ncc -O3	.78	2.02	2.35
IBM 370/165 Fast Mult	H Ext	.77		
Prime P9955II	f77 rev 20.2.b2 -opt	.72		
DEC VAX 8530	VMS v4.6	.73		
HP 9000 Series 850	2.0 fc -O	.71		
DEC VAX 8650	VMS v4.5	.70		
DEC VAX 8500	VMS v4.5	.65		
HP/Apollo DN4500 (68030 + FPA)		.60		
Mentor Graphics Computer	fortran	.60		
MIPS M/500 (8.3HHz)	f77 1.21 -O	.60		3.3
Data General MV/20000	f77	.59		
IBM 9377-80	VS Fortran 2.1.1 opt=3	.58		
Sperry 1100/80 w/SAM	FTN opt=ZEO	.58		
CDC CYBER 930-31	NOS/VE 1.2.2	.58		
Russian PS-2100	FORTRAN-PS	.57	1.6	

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Gateway 486DX-2 (66HHz)	Lahey F77, 4.00	.56		
Harris H1200	VOS 4.1 opt g	.56		
HP/Apollo DN4500 (68030)		.55		
HP 9000 Series 825	2.0 fc -O	.53		
HP-APOLLO 9000/400t (68030)	f77 -O4 rev 10.8(190)	.51		
Harris HCX-9	hf77 -O3	.50		
Pyramid 9810	OSx 4.0	.50		
HP 9000 Series 840	2.0 fc -O	.49		
DEC VAX 8600	VMS v4.5	.48		
Harris HCX-7 w/fpp	f77 1.0	.48		
CDC 6600	FTN 4.6 opt=2	.48		
CDC CYBER 170-835	FTN 5 opt=2	.47		
CCI Power 6/32 w/fpa	UNIX 4.2 bsd f77	.47		
IBM 4381-21	VS Fortran 2.1.1 opt=3	.47		
Sperry 7000	4.2	.47		
Gould PN9000	UNIX	.47		
SUN-3/260 + FPA	3.2 f77 -O -ffpa	.46		
IBM 4381 MG1	VS Fortran opt=3	.46		
DEC VAX 6210 (1 proc.)	VMS v5.0	.46		
CDC CYBER 170-835	FTN 5 opt=1	.44		
HP 9000 Series 840	HP-UX 14.3	.43		
IBM RT 135	AIX-2.2	.42		
Harris H1000	VOS 3.3 opt g	.41		
microVAX 3200/3500/3600	VMS v4.6	.41		
Apple Macintosh IIfx	A/UX 2.0 f77	.41		
Apollo DN5xxT FPX	DOMAIN/IX SR9.7 opt 4	.40		
microVAX 3200/3500/3600	ULTRIX 2.2/VFU	.40		
IBM 9370-60	VS Fortran 1.4.0 opt=3	.40		
Sun-3/160 + FPA	3.2 f77 -O -ffpa	.40		
Prime P9755	f77 rev 20.2.b2 -opt	.40		
Ridge 3200 Model 90	ROS/rf	.39		
IBM 4381-11	VS Fortran 1.4.0 opt=3	.39		
Gould 32/9705 mult acc	fort77+ 4.3	.39		
NORSK DATA ND-570/2	Fortran-500-E	.38		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Sperry 1100/80	FTN opt=ZEO	.38		
Apple Mac IIfx	Absoft -w -v -O -f -s	.37		
CDC CYBER 930-11	NOS/VE OPT=High	.37		
CSA w/T800C-20	Fortran 3L	.37		
Inmos T800 (20 MHz)	Fortran 3L -:o0	.37		
Sequent Symmetry (386 w/fpa)	Fortran -fpa -O3	.37		
CONCEPT 32/8750	UTX/32	.36		
Celerity C1230	UNIX 4.2 bsd f77	.36		
IBM RT PC 6150/115 fpa2	f77	.36		
IBM 9373-30	VS Fortran 2.1.1 opt=3	.36		
CDC 6600	RUN	.36		
Gould PN9080	UTX/32	.35		
Prime 9950	F77 19.4.2	.34		
Opus Series 300pm 30 MHz	UNIX Greenhills	.33		
Masscomp MC5600 w/fpa	f77 v1.2 -O3 rtv v3.1	.33		
Data General MV/10000	f77 opt level 2	.30		
IBM 4361 MG5	VS Fortran opt=3	.30		
DATEK 80386-33 /w 64KB Cache	MS Fortran 5.0 -Ox -AH -G2	.27		
Inmos T800 (20 MHz)	Fortran 3L -:o1	.26		
Apollo DN3500	FTN -CPU 3000 -opt 4	.25		
IRIS 2400 Turbo/FPA	f77	.24		
CDC CYBER 180-830	NOS/VE OPT=HIGH	.24		
Apple Macintosh PowerBook 170	Absoft -w -v -O -f -s	.23		
Gould PN 6005	VTX/32 2.0 Fortran 77	.23		
Harris 800	Fortran 77	.23		
IBM 370/158	H opt=3	.23		
IBM 370/158	VS Fortran opt=3	.22		
NORSK DATA ND-560	Fortran-500	.22		
Celerity C1200	UNIX 4.2 bsd f77	.21		
Honeywell DPS 8/70	FR7X	.21		
Denelcor HEP	f77 UPX	.21		
VAX 11/785 FPA	VMS v4.5	.20		
CDC CYBER 170-720	FTN 5, opt=2	.20		
Apple Macintosh IIsi	Absoft -w -v -O -f -s	.19		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Itel AS/5 mod 3	H	.19		
NORSK DATA ND-500	Fortran-500-E	.19		
KONTRON KSM/386	UNIX SVS F77 2.8	.19		
Sun 386i/250 25 MHz	SunOS 4.0; Sun 1.1 -O	.19		
CDC CYBER 170-825	FTN 5, opt=2	.19		
IBM 4341 MG10	VS Fortran opt=3	.19		
Apollo DN2500		.18		
Pyramid 98xe	OSx 4.0	.18		
IBM 9370-40	VS Fortran 1.4.0 opt=3	.18		
VAX 11/785 FPA	UNIX 4.2 bsd f77	.18		
DEC VAX 8250/8350 (UP)	VMS v4.6	.18		
CDC CYBER 170-825	FTN 5, opt=1	.18		
Ridge Server/RT EFP	ROS/rf	.18		
CDC CYBER 170-720	FTN 5, opt=1	.17		
Ridge 32/130	OS 3.3/RISC	.17		
PC Craft 2400/25MHz w/80387	PLI Fortran 2.09	.17		
Concurrent 3252	OS 6.2.4 fortran z	.17		
Tandy 5000 MC 20 MHz	LPI Fortran 3.0	.17		
Tektronix 4315 w/68882	UTEK f77	.17		
CDC CYBER 180-810	NOS/VE OPT=HIGH	.17		
Prime P2755	f77 rev 20.2.b2 -opt	.17		
Apple Macintosh IIx	A/UX 2.0 f77	.16		
Concurrent 3242	OS 32 v7.2 f77	.16		
Compaq 386/20 w/387	Microsoft Fortran 4.1	.16		
Apple Macintosh IIcx	Absoft -w -v -O -f -s	.15		
Apple Macintosh IIx	Absoft -w -v -O -f -s	.15		
DEC VAX 8200/8300	VMS v4.5	.15		
IBM PS/2-70 (20 MHz)	AIX 1.2	.15		
Apple Macintosh SE 30	Absoft -w -v -O -f -s	.14		
Apollo DN4000	DOMAIN/IX SR9.7 opt 4	.14		
ICL 2988	f77 OPT=2	.14		
IBM 9370-20	VS Fortran 1.4.0 opt=3	.14		
HP Vectra RS/20C 20 MHz	LPI Fortran 3.0	.14		
VAX 11/780 FPA	VMS v4.5	.14		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Compaq 386/20 w/387	RM/Forrtan 2.43	.13		
microVAX II	VMS v4.5	.13		
Prime P2450	f77 rev 20.2.b2 -opt	.13		
Apple Macintosh IIsi	Fortran	.12		
Apple Mac II/16 Mhz/25 Mhz 68882	Absoft 2.4 -w -v -O -f -s	.12		
CDC 6500	FUN	.12		
CONCEPT 32/6750	UTX/32	.12		
IBM PS/2-70 (16 MHz)	AIX 1.2	.12		
IBM RT w/68881	f77	.12		
VAX 11/750 FPA	VMS v4.1	.12		
micro VAX II	ULTRIX 2.2/VFU	.12		
Concurrent 3230	OS 6.2.2 fortran 5.2	.11		
Definicon DSI-780	SVS Fortran (MSDOS)	.11		
ENCORE Multimax NS32332	f77	.11		
HP 9000 Series 350	HP-UX, f77 5.2	.11		
Northgate 386/387 (25MHz)	Lahey F77, 4.00	.11		
Prime 750	Primos f77 v19.1	.11		
Sun 3/260, 20 MHz 68881	3.2 f77 -O -f68881	.11		
Tektronix 4315 w/68881	UTEK f77	.11		
VAX 11/780 FPA	UNIX 4.3 BSD f77 -O	.11		
Sun 3/160, 16.7 MHz 68881	3.2 f77 -O -f68881	.10		
NCUBE (1 proc. 8 MHz)	Fortran	.10		
Apple Mac SE/30	ABSOFT 2.4	.10		
Apollo DN590	DOMAIN/IX SR9.7 opt 4	.099		
Masscomp MC5600 68881	f77 v1.2 -O3 rtv v3.1	.099		
VAX 11/750 FPA	UNIX 4.2 bsd f77	.096		
Prime 850	Primos	.095		
Sperry 1100/60	FTN opt=ZEO	.093		
Pyramid 90X FPA	UNIX 4.2 bsd f77	.088		
Apple Mac II/16 Mhz/25 Mhz 68882	Absoft 2.4	.087		
SUN-3/50, 16.7 MHz 68881	3.2 f77 -O -f68881	.087		
HP 9000 Series 330	HP-UX, f77 5.2	.087		
Apple Macintosh II	Absoft -w -v -O -f -s	.083		
microVAX II	f77 Ultrix 1.1	.082		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
Apple Mac SE + 20 MHz 68881	ABSOFT 2.4	.082		
Ridge 32/110	ROS 3.3/RISC	.081		
Data General MV/8000	f77 opt level 2	.078		
Apple MAC II w/882		.078		
Prime P2350	f77 rev 20.2.b2 -opt	.077		
Apple Mac/Levco Prodigy 4	ABSOFT MacFort 020	.076		
Apple Mac II w/68020	FORTRAN	.074		
HP 9000 Series 320	HP-UX, f77 5.2	.073		
Apollo DN3000	DOMAIN/IX SR9.7 opt 4	.071		
Apollo DN460/660	AEGIS 8.0 FTN	.069		
Masscomp MC500 w/FPP	3.1 Fortran	.061		
Harris HS-20 w/FPP	Fortran 77 3.1	.061		
Sequent Balance 8000	DYNIX Fortran 2.4.4	.059		
Definicon DSI-32/10	Greenhills f77 (MSDOS)	.057		
VAX 11/750	VMS v4.1	.057		
Encore Multimax	f77	.055		
HP 9000 Series 500	Fortran 1.7	.043		
Opus 32.32	UNIX, f77 4.2 bsd	.043		
ATT 3B20 FP	UNIX V 2.0/4	.040		
Acorn Cambridge	fortran	.039		
IBM 4331 MG2	H opt=3	.038		
Burroughs B6800	Fortran 77 ver 34	.037		
VAX 11/725 FPA	VMS v4.1	.037		
Masscomp MCS-541 w/FPB	Fortran 3.1	.037		
IBM RT PC Model 20	f77	.036		
VAX 11/730 FPA	VMS	.036		
Prime 2250	Fortran 77	.034		
IBM PC-AT/370	VS Fortran opt=3	.033		
IBM PC-XT/370	H opt=3	.031		
VAX 11/750	UNIX 4.2 bsd f77	.029		
Apollo DN320	AEGIS 8.0 FTN	.028		
Sun 2/50 + SKY FFP	f77 -O -fsky 3.0	.027		
Ametek S14/32 (1 node)	RM Fortran 2.11	.026		
Apollo DN550 FPA	AEGIS 8.0 FTN	.025		

Computer	"LINPACK Benchmark" OS/Compiler	n=100 Mflop/s	"TPP" Best Effort n=1000 Mflop/s	"Theoritical Peak" Mflop/s
AMSTRAC 1512 8086/8087 9.54 MHz	MS-Fortran 4.0 -Ox -AH	.022		
microVAX I	VMS	.023		
Canaan	VS	.021		
Chas. River Data 6835+SKY	SVS Fortran 77	.018		
Apollo DN 420 PEB	AEGIS 7+ FTN	.017		
IBM AT w/80287	PROFORT 1.0	.012		
IBM PC w/8087	PROFORT 1.0	.012		
Cadtrak DS1/8087	Intel Fortran 77	.011		
Apple Mac Classic II/16 MHz68030	Absoft 2.4	.011		
IBM PC/AT w/80287	Microsoft 3.2	.0091		
Chas. River Data 6835	SVS Fortran 77	.0088		
Apollo DN300	AEGIS 8.0 FTN	.0071		
Masscomp MC500	3.1 Fortran	.0070		
IBM PC w/8087	Microsoft 3.2	.0069		
Apple Mac II	ABSOFT 2.4	.0064		
HP 9000 Series 200	HP-UX	.0062		
Sun 2/50	f77 -O -fsoft 3.0	.0055		
Atari ST	ABSOFT AC/Fortran v2.2	.0051		
Apple Macintosh	ABSOFT 2.0b	.0038		
Palm Pilot III		.00169		

Table 2: **A Look at Parallel Processing**

Computer	**1000 x 1000 Problem with Parallel Processing**				
	Time uniprocessor	**no. of procs**	**Time multiprocs**	**Speedup**	**Efficiency**
Hitachi S-3800/480	0.104	4	.0324	3.21	.80
Hitachi S-3800/380	0.104	3	.0396	2.63	.88
Hitachi S-3800/280	0.104	2	.0549	1.89	.95
NEC SX-3/*4R	0.128	4	.0442	2.91	.73
NEC SX-3/*4R	0.128	2	.0707	1.82	.91
NEC SX-3/*4	0.148	4	.0498	2.98	.74
NEC SX-3/*4	0.148	2	.0821	1.81	.90
NEC SX-3/*2R	0.243	4	.0747	3.25	.81
NEC SX-3/*2R	0.243	2	.1307	1.86	.93
NEC SX-3/*2	0.293	4	.0863	3.40	.85
NEC SX-3/*2	0.293	2	.1518	1.93	.96
Cray C90	0.740	16	.0618	11.95	.75
Cray C90	0.740	8	.108	6.85	.86
Cray C90	0.740	4	.204	3.63	.91
Cray C90	0.740	2	.392	1.89	.94
NEC SX-3	0.149	2	.0820	1.82	.91
NEC SX-3/*1R	0.472	4	.139	3.40	.85
NEC SX-3/*1R	0.472	2	.255	1.85	.93
Convex C4/XA	0.949	4	.264	3.59	.90
Convex C4/XA	0.949	3	.346	2.74	.91
Convex C4/XA	0.949	2	.501	1.89	.95
IBM ES/9000 (7.1 ns)	1.58	8	.293	5.34	.67
IBM ES/9000 (7.1 ns)	1.58	7	.322	4.91	.70
IBM ES/9000 (7.1 ns)	1.58	6	.347	4.56	.76
IBM ES/9000 (7.1 ns)	1.58	5	.397	3.98	.80
IBM ES/9000 (7.1 ns)	1.58	4	.485	3.26	.82
IBM ES/9000 (7.1 ns)	1.58	3	.617	2.56	.85
IBM ES/9000 (7.1 ns)	1.58	2	.871	1.82	.91
Cray Y-MP/8	2.17	8	.312	6.96	.87
Cray Y-MP/8	2.17	4	.577	3.76	.94
Cray Y-MP/8	2.17	3	.754	2.88	.96
Cray Y-MP/8	2.17	2	1.11	1.96	.98
Cray Y-MP/98	2.17	8	.386	5.65	.71
Cray Y-MP/98	2.17	4	.600	3.63	.91
Cray Y-MP/98	2.17	2	1.12	1.94	.97
IBM ES/9000 (9 ns)	1.98	6	.458	4.31	.72
IBM ES/9000 (9 ns)	1.98	5	.552	3.58	.72
IBM ES/9000 (9 ns)	1.98	4	.666	2.97	.74
IBM ES/9000 (9 ns)	1.98	3	.862	2.29	.76
IBM ES/9000 (9 ns)	1.98	2	1.24	1.59	.80
Cray 2S	1.76	4	.476	3.66	.91
Cray 2S	1.76	3	.617	2.82	.94

Computer	1000 x 1000 Problem with Parallel Processing				
	Time uniprocessor	no. of procs	Time multiprocs	Speedup	Efficiency
Cray 2S	1.76	2	.902	1.93	.96
Cray X-MP/4	3.10	4	.813	3.78	.94
Cray X-MP/4	3.10	3	1.07	2.87	.96
Cray X-MP/4	3.10	2	1.57	1.96	.98
Convex C3880	5.90	8	.841	7.02	.88
Convex C3840	5.90	4	1.58	3.74	.94
Convex C3830	5.90	3	2.05	2.88	.96
Convex C3820	5.90	2	3.01	1.96	.98
DEC 10000 Alpha	4.31	6	.889	4.85	.81
DEC 10000 Alpha	4.31	5	1.04	4.12	.82
DEC 10000 Alpha	4.31	4	1.28	3.37	.84
DEC 10000 Alpha	4.31	3	1.66	2.60	.87
DEC 10000 Alpha	4.31	2	2.44	1.76	.88
Convex SPP-1000	i 5.45	8	0.8905	6.120	.77
Convex SPP-1000	i 5.45	4	1.513	3.602	.90
Convex SPP-1000	i 5.45	2	2.628	2.073	1.03
Cray S-MP/MCP784	21.4	84	.902	23.7	.28
Cray S-MP/MCP756	21.4	56	.986	21.7	.39
Cray S-MP/MCP728	21.4	28	1.32	16.2	.58
Cray S-MP/MCP707	21.4	7	3.46	6.19	.88
DEC 7000 Alpha	4.74	6	.978	4.84	.81
DEC 7000 Alpha	4.74	5	1.14	4.16	.83
DEC 7000 Alpha	4.74	4	1.38	3.43	.86
DEC 7000 Alpha	4.74	3	1.81	2.62	.87
DEC 7000 Alpha	4.74	2	2.67	1.77	.89
Meiko CS2	6.89	64	1.03	6.69	.10
Meiko CS2	6.89	32	1.03	6.69	.21
Meiko CS2	6.89	16	1.26	5.47	.34
Meiko CS2	6.89	8	1.59	4.33	.54
Meiko CS2	6.89	4	2.32	2.97	.74
Meiko CS2	6.89	2	3.96	1.74	.87
Fujitsu AP1000	160	512	1.10	147	.29
Fujitsu AP1000	160	256	1.50	108	.42
Fujitsu AP1000	160	128	2.42	66.5	.52
Fujitsu AP1000	160	64	3.51	46.0	.72
Fujitsu AP1000	160	32	6.71	24.0	.75
Fujitsu AP1000	160	16	11.5	13.9	.87
Fujitsu AP1000	160	8	22.6	7.12	.89
Fujitsu AP1000	160	4	41.3	3.90	.97
Fujitsu AP1000	160	2	81.4	1.96	.98
IBM 3090/J (14.5 ns)	6.8832	6	1.24	5.57	.93
IBM 3090/J (14.5 ns)	6.8832	5	1.46	4.72	.94
IBM 3090/J (14.5 ns)	6.8832	4	1.80	3.81	.95
IBM 3090/J (14.5 ns)	6.8832	3	2.35	2.93	.98

Computer	1000 x 1000 Problem with Parallel Processing				
	Time uniprocessor	no. of procs	Time multiprocs	Speedup	Efficiency
IBM 3090/J (14.5 ns)	6.8832	2	3.48	1.98	.99
IBM 3090/600S VF	7.27	6	1.29	5.64	.94
IBM 3090/500S VF	7.27	5	1.52	4.78	.96
IBM 3090/400S VF	7.27	4	1.89	3.85	.96
IBM 3090/300S VF	7.27	3	2.46	2.96	.99
IBM 3090/280S VF	7.27	2	3.65	1.99	.99
IBM 3090/200S VF	7.27	2	3.64	1.99	.99
Kendall Square Research	21.5	32	1.30	16.5	.52
Kendall Square Research	21.5	16	2.17	9.90	.62
Kendall Square Research	21.5	8	4.57	4.71	.59
Kendall Square Research	21.5	4	14.2	1.52	.38
IBM ES/9000 (11 ns)	5.14	4	1.51	3.39	.85
IBM ES/9000 (11 ns)	5.14	3	1.90	2.71	.90
IBM ES/9000 (11 ns)	5.14	2	2.74	1.88	.94
Intel Delta	22	512	1.5	14.7	.03
Intel Delta	22	256	1.6	13.8	.05
Intel Delta	22	128	1.7	12.9	.10
Intel Delta	22	64	1.9	11.5	.18
Intel Delta	22	32	2.2	10.0	.31
Intel Delta	22	16	2.9	7.59	.47
Intel Delta	22	8	4.1	5.37	.67
Intel Delta	22	4	6.7	3.28	.82
Intel Delta	22	2	11.6	1.90	.95
IBM 3090/600E VF	9.36	6	1.73	5.41	.90
IBM 3090/500E VF	9.36	5	2.02	4.63	.93
IBM 3090/400E VF	9.36	4	2.48	3.77	.94
IBM 3090/300E VF	9.36	3	3.21	2.92	.97
IBM 3090/200E VF	9.36	2	4.73	1.98	.99
Sun Sparc2000(50 MHz)	23.85	16	2.01	11.89	.74
Sun Sparc2000(50 MHz)	23.85	12	2.26	10.54	.88
Sun Sparc2000(50 MHz)	23.85	8	2.99	7.96	.99
Alliant FX/2800-200	22.9	14	2.06	11.1	.79
Alliant FX/2800-200	22.9	12	2.30	10.0	.83
Alliant FX/2800-200	22.9	10	2.68	8.54	.85
Alliant FX/2800-200	22.9	8	3.24	7.07	.88
Alliant FX/2800-200	22.9	4	6.07	3.77	.94
Alliant FX/2800-200	22.9	2	11.8	1.94	.97
IBM PVS	20.4	32	2.17	9.35	.29
IBM PVS	20.4	16	2.35	8.64	.54
IBM PVS	20.4	8	3.41	5.95	.74
IBM PVS	20.4	4	5.71	3.56	.89
IBM PVS	20.4	2	10.6	1.92	.96
IBM RS/6000 Cluster (62.5 ns)	7.42	8	2.48	2.99	.37
IBM RS/6000 Cluster (62.5 ns)	7.42	4	3.24	2.29	.57

Computer	1000 x 1000 Problem with Parallel Processing				
	Time uniprocessor	**no. of procs**	**Time multiprocs**	**Speedup**	**Efficiency**
IBM RS/6000 Cluster (62.5 ns)	7.42	2	4.64	1.60	.80
nCUBE 2	331	1024	2.59	128	.12
nCUBE 2	331	512	3.29	101	.20
nCUBE 2	331	256	4.05	81.7	.32
nCUBE 2	331	128	5.74	57.7	.45
nCUBE 2	331	64	8.70	38.0	.59
nCUBE 2	331	32	14.5	22.8	.71
nCUBE 2	331	16	25.6	12.9	.81
nCUBE 2	331	8	46.9	7.04	.88
nCUBE 2	331	4	89.1	3.71	.93
nCUBE 2	331	2	171.	1.93	.97
Intel iPSC/860	22	128	2.8	7.68	.06
Intel iPSC/860	22	64	3.2	6.72	.11
Intel iPSC/860	22	32	4.0	5.38	.17
Intel iPSC/860	22	16	5.1	4.22	.26
Intel iPSC/860	22	8	6.5	3.31	.41
Intel iPSC/860	22	4	8.9	2.42	.60
Intel iPSC/860	22	2	12.8	1.68	.84
Meiko Computing Surface (i860)	21.9	32	3.19	6.85	.21
Meiko Computing Surface (i860)	21.9	24	3.30	6.62	.28
Meiko Computing Surface (i860)	21.9	16	3.57	6.12	.38
Meiko Computing Surface (i860)	21.9	8	4.56	4.79	.60
Meiko Computing Surface (i860)	21.9	4	6.83	3.20	.80
Meiko Computing Surface (i860)	21.9	2	11.6	1.88	.94
IBM RS/6000 Cluster (50 ns)	7.95	8	3.44	2.31	.29
IBM RS/6000 Cluster (50 ns)	7.95	6	3.84	2.07	.35
IBM RS/6000 Cluster (50 ns)	7.95	4	4.39	1.81	.45
IBM RS/6000 Cluster (50 ns)	7.95	2	6.02	1.32	.66
Sun Sparc2000(50 MHz)	26.71	8	3.37	7.92	.99
Sun Sparc2000(50 MHz)	26.71	4	6.24	4.28	1.07
Sun Sparc2000(50 MHz)	26.71	2	12.60	2.12	1.06
Convex C3240	14.9	4	3.92	3.81	.95
Convex C3230	14.9	3	5.06	2.95	.98
Convex C3220	14.9	2	7.50	1.99	.99
Convex C-240	15	4	4.03	3.76	.94
Convex C-230	15	3	5.20	2.91	.97
Convex C-220	15	2	7.65	1.98	.99
Parsytec FT-400	1075	400	4.90	219.	.55
Parsytec FT-400	1075	256	6.59	163.	.64
Parsytec FT-400	1075	100	13.2	81.4	.81

Computer	1000 x 1000 Problem with Parallel Processing				
	Time uniprocessor	**no. of procs**	**Time multiprocs**	**Speedup**	**Efficiency**
Parsytec FT-400	1075	64	19.1	56.3	.88
Parsytec FT-400	1075	16	69.2	15.5	.97
Sun Sparc10/514(50 MHz)	24.73	4	6.81	3.63	.91
Sun Sparc10/514(50 MHz)	24.73	2	11.71	2.11	1.06
FPS Model 522	12	2	6.36	1.89	.95
Suprenum S1C1	51	16	6.4	8.0	.50
Suprenum S1C1	51	14	7.1	7.2	.51
Suprenum S1C1	51	12	7.9	6.5	.54
Suprenum S1C1	51	10	8.9	5.8	.58
Suprenum S1C1	51	8	10.4	4.9	.61
Suprenum S1C1	51	6	13.1	3.9	.65
Suprenum S1C1	51	4	18.1	2.8	.70
Suprenum S1C1	51	2	33.4	1.5	.75
Alliant FX/800-200	24.2	4	7.09	3.41	.85
Alliant FX/800-200	24.2	2	12.7	1.91	.95
Alliant FX/80	57.7	8	9.64	5.99	.75
Alliant FX/80	57.7	7	10.6	5.44	.78
Alliant FX/80	57.7	6	11.8	4.89	.82
Alliant FX/80	57.7	5	13.6	4.24	.85
Alliant FX/80	57.7	4	16.2	3.56	.89
Alliant FX/80	57.7	3	20.7	2.79	.93
Alliant FX/80	57.7	2	29.8	1.94	.97
Stardent 1540 (Ardent Titan-4)	51.2	4	14.3	3.57	.89
Stardent 1530 (Ardent Titan-3)	51.2	3	18.3	2.80	.93
Stardent 1520 (Ardent Titan-2)	51.2	2	26.3	1.95	.97
SGI 4D/480 40 MHz	54.0	8	9.48	5.70	.71
SGI 4D/440 40 MHz	54.0	4	15.91	3.39	.85
SGI 4D/420 40 MHz	54.0	2	28.80	1.88	.94
SGI 4D/380 33 MHz	65.0	8	11.13	5.84	.73
SGI 4D/340 33 MHz	65.0	4	18.62	3.49	.87
SGI 4D/320 33 MHz	65.0	2	34.17	1.90	.95
Sun Sparc10/402(40 MHz)	29.03	2	16.28	1.78	.89
Alliant FX/40	66.1	4	20.5	3.22	.81
Alliant FX/40	66.1	3	24.9	2.65	.88
Alliant FX/40	66.1	2	34.8	1.90	.95
SGI 4D/240 25 MHz	85.2	4	23.89	3.57	.89
SGI 4D/220 25 MHz	85.2	2	44.89	1.90	.95
Alliant FX/4	106	4	32.3	3.28	.82
Alliant FX/4	106	3	38.7	2.74	.91
Alliant FX/4	106	2	55.8	1.90	.95
DEC VAX 6000-460	439	6	80	5.5	.92
DEC VAX 6000-450	439	5	94	4.7	.94
DEC VAX 6000-440	439	4	114	3.8	.96
DEC VAX 6000-430	439	3	152	2.9	.96

Computer	1000 x 1000 Problem with Parallel Processing				
	Time uniprocessor	no. of procs	Time multiprocs	Speedup	Efficiency
DEC VAX 6000-420	439	2	222	1.9	.99
ELXSI 6420	475	5	104	4.57	.91
ELXSI 6420	475	3	167	2.84	.95
ELXSI 6420	475	2	245	1.94	.97
DEC VAX 6240	1295	4	332	3.90	.98
DEC VAX 6230	1295	3	439	2.95	.98
DEC VAX 6220	1295	2	654	1.98	.99
Sequent Balance 21000	11111	30	445	25.0	.83

Table 3: **Highly Parallel Computing**

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
NUDT, Inspur Tianhe-2 (TH-2) Model TH-IVB-FEP Nodes=16000 2 Intel Xeon IvyBridge (6 core) E5-2692 2.2GHz & 3 Intel Xeon Phi 31S1P	2371200	22808300	6974976		41733120
IBM Blue Gene/Q Power BCQ 1.6 GHz (120 racks * 1024 nodes/rack * 16 cores/node) w/Custom	1966080	21466530	14942207		25165824
IBM Blue Gene/Q Power BCQ 1.6 GHz (96 racks * 1024 nodes/rack * 16 cores/node) w/custom	1572864	16324751	12681215		20132659
IBM Blue Gene/Q Power BCQ 1.6 GHz (72 racks * 1024 nodes/rack * 16 cores/node) w/custom	1179648	12003644	10715135		15099494
K computer, Fujitsu SPARC64 VIIIfx 2.0GHz, 8 core w/Tofu interconnect	705024	10510000	11870208		11280384
K computer, Fujitsu SPARC64 VIIIfx 2.0GHz, 8 core w/Tofu interconnect	548352	8162000	10725120		8773632
IBM Blue Gene/Q Power BCQ 1.6 GHz (48 racks * 1024 nodes/rack * 16 cores/node) w/custom	786432	8152590	8912895		10066330
IBM Blue Gene/Q Power BCQ 1.6 GHz (24 racks * 1024 nodes/rack * 16 cores/node) w/custom	393216	4141180	6422527		5033165
IBM iDataPlex dx360 M4 2 x Intel E5-2680v2 (2.8 GHz) Ivy Bridge CPU Cores: 26,100 (1305 nodes * 2 sockets * 10 cores/socket) GPUs: NVIDIA 2 x K20x -GPU cores: 36,540 InfiniBand FDR	62640	3003000	3838464		4003740
IBM iDataPlex DX360M4 Intel Sandybridge 2.7 GHz (9216 nodes * 2 sockets * 8 cores/socket) w/InfiniBand	147456	2897000	5201920		3185050
TH-1A (14336 6-core Intel X5670 2.93 GHz + 7168 Nvidia M2050 w/custom interconnect)	186368	2566000	3600000	1000000	4701061
IBM iDataPlex DX360M4 Intel Sandybridge 2.7 GHz (7168 nodes * 2 sockets * 8 cores/socket) w/InfiniBand	114688	2072000	4464640		2477261
IBM Power 775 (IBM POWER7 3.836 GHz w/Custom (equivlent to 247.5 drawers x 8 sockets per drawer x 32 cores per socket))	63360	1515000	2280960		1944392
IBM Power 775 (IBM POWER7 3.836 GHz) (216 drawers x 8 sockets per drawer x 32 cores per socket) Custom	55296	1429000	4147200		1696923
IBM Blue Gene/Q Power BCQ 1.6 GHz (8 racks * 1024 nodes/rack * 16 cores/node) w/custom	131072	1358197	3899391		1677721
464 Dawning TC3600 Blade System 4640 Computing Nodes (2*Intel 6 core X5650 2.666 GHz, 1*NVidia Tesla C2050 GPU) w/InfiniBand	120640	1271000	2359296		2983520
IBM Power 775 (POWER7 3.836 GHz, w/custom) (8 sockets per drawer x 32 cores per socket)	47488	1183000	3419136		1457311
IBM BladeCenter cluster of 3240 nodes dual socket 1.8 GHz Opteron (dual core) LS21 blades plus 6480 nodes dual socket 3.2 GHz PowerXCell 8i (8 SPU + 1 PPU cores) QS22 blades w/InfiniBand	129600	1105000	2329599		1456704
TSUBAME 2.0; 1357 HP Proliant SL390s G7 nodes w/ Xeon X5670 (2.93GHz) 6cores x 2sockets, NVIDIA Tesla M2050 (1.15GHz) 14cores x 3chips and QDR InfiniBand x 2rails; SUSE Linux Enterprise server 11	73278	1192000	2490368		2287630
Cray XT5 (Opteron quad core 2.3 GHz)	150152	1059000	4712799		1381400
Cray XE6 (AMD 12-core, 2.1Ghz w/custom interconnect)	153408	1054000	4537344		1288627
IBM BladeCenter cluster of 3060 nodes dual socket 1.8 GHz	122400	1042000	2249343		1375776

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Opteron (dual core) LS21 blades plus 6120 nodes dual socket 3.2 GHz PowerXCell 8i (8 SPU + 1 PPU cores) QS22 blades w/InfiniBand					
BM iDataPlex DX360M4 (dual socket - 10 core Ivy Bridge 2.8 GHz) InfiniBand FDR14	60000	1033110	2880000		1344000
DOE/NNSA/LANL IBM BladeCenter cluster of 3060 nodes dual socket 1.8 GHz Opteron (dual core) LS21 blades plus 6120 nodes dual socket 3.2 GHz PowerXCell 8i (8 SPU + 1 PPU cores) QS22 blades w/InfiniBand	122400	1026000	2236927		1375776
Cray XT5 (AMD six-core 2.6 GHz Istanbul)	112800	919100	3844936		1173000
IBM Power 775 (IBM POWER7 3.836 GHz (155 drawers x 256 cores/drawer)) w/Custom	39680	886400	3571200		1217700
Cray XT-5 AMD six-core 2.6 GHz Istanbul	98928	831750	3718960		1028851
IBM Blue Gene/P Soltuion (Quad core 0.85 GHz PowerPC 450 w/custom)	294912	825500	4043519		10027000
IBM Blue Gene/P Soltuion (Quad core 0.85 GHz PowerPC 450 w/custom)	294912	819600	3981311		1002700
Mole-8.5 256 computing nodes, each node contains: 2 2.267GHz 4-core Xeon 5520, 6 nVidia Tesla C2050 (Fermi) GPU cards, w/QDR Infiniband	23552	809611	710400		1497000
National Research Center of Parallel Computer Engineering & Technology 8704 Propriety nodes, 16 core (.975 GHz w/InfiniBand QDR)	137200	795900	3375120		1070160
330 IBM iDatPlex DX360M4 Compute nodes: (2x Intel IvyBridge 2.8 GHz 10core) (2x Nvidia K20x GPUs (660 total)) FDR14	15840	709700	1048320		1012440
1IBM Blue Gene/Q Power BCQ 1.6 GHz (4 racks * 1024 nodes/rack * 16 cores/node) w/custom	65536	689758	2752511		838861
IBM Blue Gene/Q IBM BQC 1.6 GHz w/ Proprietary Nodes: 4096 Cores/node: 16	65536	677104	2719743		838800
Lomonosov 4420 nodes of 2 x Intel Xeon 5570 Nehalem (4 cores, 2.93 GHz) + 680 nodex of 2 x Intel Xeon 5670 Westmere (6 cores, 2.93 GHz) + 777 nodes of 2 x Intel Xeon 5670 Westmere (4 cores, 2.53 GHz) 2 x M2070 Tesla	71492	674100	2073599		1373000
SGI Altix ICE 8200EX (92 racks Xeon QC 3.0 Ghz + 18 racks Xeon 2.93 Ghz w/Infiniband)	56320	544300	2458680		673259
IBM BlueGene/L DD2 Prototype cluster (dual 0.7 GHz PowerPC 440 w/custom)	212992	478200	2456063		596378
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	163840	450300	2580479		557056
Cray XT5 (Opteron quad core 2.3 GHz)	66000	463300	2078999		607000
IBM Flex System p460 IBM POWER7 3.55 GHz (560 nodes x 32 cores per node) Infiniband QDR	17920	434800	2400000		508928
IBM Blue Gene/P Soltuion (Quad core 0.85 GHz PowerPC 450 w/custom)	147456	415700	2958335		501350
IBM iDataPlex DX360M4 (2 socket 8 core Sandybridge 2.6 GHz) Number of nodes: 464 CPU cores: 7,424 (464 nodes x 2 sockets/node x 8 cores/socket) Accelerator: 464 Intel Phi (MIC) - 1 per node Accelerator cores; 27,840 (464 Phi x 60 cores/Phi) w/Infiniband QDR	35264	368455	768000		623467
IBM iDataPlex DX360M4 (2 socket 12 core Ivy Bridge 2.7 GHz) InfiniBand FDR14	18144	352671	2370816		391910
T-Platforms T-Blade2 (Intel Xeon X5570 quad core, 2.933	35360	350100	2489344		414419

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Ghz, w/QDR InfiniBand)					
BM iDataPlex DX360M4 (dual socket - 12 core Ivy Bridge 2.7 GHz) InfiniBand FDR14	18240	347647	2371200		393984
IBM Blue Gene/Q IBM BQC 1.6 GHz w/ Proprietary Nodes: 2048 Cores/node: 16	32768	339834	1949695		419400
IBM NeXtScale nx360 M4 Ivy Bridge 2.5 GHz Cores: 16,820 (841 nodes * 2 sockets * 10 cores/socket) InfiniBand FDR	16820	326572	2000000		336400
IBM NeXtScale nx360 M4 Ivy Bridge 2.5 GHz (812 nodes * 2 sockets * 10 cores/socket) InfiniBand FDR	16240	323611	1800000		324800
Cray XE6 (12Core AMD Opteron 6174 (Magny-Cours) 2.2 GHz)	45504	295500	2472456		400430
IBM iDataPlex DX360M4 Intel Sandybridge 2.7 GHz (9216 nodes * 2 sockets * 8 cores/socket) w/InfiniBand	147456	2877000	5038080		3185049
IBM BlueGene/L DD2 Prototype cluster (dual 0.7 GHz PowerPC 440 w/custom)	131072	280600	1769471		367001
HITACHI SR16000/M1 322 nodes (3836MHz)	10304	253000	1858560		316209
HITACHI SR16000-M1/320 (3830MHz)	9984	243900	1576960		306389
IBM iDataPlex DX360M2 Intel Nehalem 2.53 GHz (3824 nodes * 2 sockets/node * 4 cores/socket) w/InfiniBand	30592	261631	2526944		309591
IBM iDataPlex DX360M4 (2 socket Sandybridge 2.6 GHz nodes: 234 CPU cores: 3,744 (234 nodes x 2 sockets/node x 8 cores/socket) Accelerator: 234 Intel Phi (MIC) - 1 per node Accelerator cores; 14,040 (234 * 60) Internconnet: Infiniband	17784	220031	896000		302515
IBM Blue Gene/Q Power BCQ 1.6 GHz (1 racks * 1024 nodes/rack * 16 cores/node) w/custom	16384	172691	1376255		209715
320 hybrid nodes (Intel 2-way 2.267GHz 4-core Xeon 5520 plus 6 nVidia Tesla C2050 (Fermi) GPU cards per node) connected with QDR Mellanox Infiniband	29440	207300	1113600		1012653
Intel (6-core Xeon X5660, 2.8 GHz, 2 sockets/node, IB QDR)	23040	192500	2255040		258000
IBM Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/custom)	65536	190900	2654207		222822
IBM Blue Gene/Q Power BCQ 1.6 GHz (1 rack * 1024 nodes/rack * 16 cores/node) w/Custom	16384	188967	1409023		209715
IBM Power 775 IBM POWER7 3.836 GHz w/Custom	8192	185100	1433088		251396
Dawning 5000A, AMD 8347 HE Opteron (quadcore, 1.9GHz, w/Infiniband, Windows HPC server 1920 nodes)	30720	180600	300208		233472
IBM iDataPlex DX360M4 Intel Sandybridge 2.7 GHz w/InfiniBand (512 nodes * 2 sockets * 8 cores/socket)	8192	176947	1198080		164800
IBM Blue Gene/Q IBM BQC 1.6 GHz w/Proprietary Nodes: 1024 Cores/node: 16	16384	172494	1376255		209700
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/GigE)	29920	168600	2716430		302790
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/ Custom)	65536	167300	1766399		222820
IBM System x iDataPlex dx360 M3 1360 nodes (Intel Xeon X5670 (Westmere EP) 2.93 GHz w/Infiniband 4x QDR QLogic)	16320	168800	1958400		191270
IBM System x iDataPlex dx360 M3 (Intel Xeon X5670 (Westmere EP) 2.93 GHz w/Infiniband 4x QDR QLogic)	8160	165300	1305600		191270

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM Power 775 (IBM POWER7 3.836 GHz custom interconnect)	6912	159600	1429000		212115
256 x HP DL165 dual socket 2.3GHz AMD(12 core); 368 x HP SL160 dual socket 2.67GHz Opteron (hex core); 150 x IBM dx360 dual socket 2.67GHz Opteron (hex core); 564 x IBM dx340 dual socket 2.33GH Xeon (quad core); 376 x Sun/Oracle X2200 dual socket 2.3GHz Opteron (quad core); 512 x Dell 1950e dual socket 2.32GHz Xeon (quad core); 2225 nodes w/ Myricom 10G interconnect	20925	149900	1790200		193900
256 hybrid nodes (Intel 2-way 2.267GHz 4-core Xeon 5520 plus 6 nVidia Tesla C2050 (Fermi) GPU cards per node) connected with QDR Mellanox Infiniband	23552	149700	710400		809611
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/ Custom)	65536	145400	1757183		222820
IBM iDataPlex DX360M2 (Intel Westmere 2.4 GHz Nodes 256 CPU Cores: 3072 (256 nodes * 2 sockets * 6 cores) GPU: 512 nVIDIA M2070 w/InfiniBand) (256 nodes * 2 sockets * 6 cores * 4 fp per cycle) + (512 GPUs * 515.2 fp per GPU)	10240	142700	1159000		293273
IBM BlueGene/L DD2 Prototype cluster (dual 0.7 GHz PowerPC 440 w/custom)	65536	136800	1277951		183500
1200 IBM System x iDataPlex dx360 M3 (Intel Xeon X5650 (Westmere EP) 2.66 GHz w/Infiniband QDR QLogic)	14400	136300	1532160		153216
HP Cluster Platform 3000 BL460c (Dual Intel Xeon 3 GHz quad core E5365 (Clovertown) w/Infiniband 4X DDR)	14400	132800	1850000	250000	172608
Intel (6-core Xeon X5660, 2.8 GHz, 2 sockets/node, IB QDR)	15444	131500	1894464		173000
Cluster Platform 3000 BL460c, Xeon 53xx 3GHz, Infiniband	14240	129300	1750000		170880
SGI Altix ICE 8200, Xeon quad core 3.0 GHz	14336	126900	1831872		172032
IBM BladeCenter cluster (360 nodes dual socket 1.8 GHz Opteron (dual core) & 720 nodes dual socket 3.2 GHz PowerXCell 8i QS22 blades w/InfiniBand)	14400	126500	805759		161856
USC Cluster (256 x HP SL160 dual socket 2.67GHz Opteron (hex core) 160 x IBM dx360 dual socket 2.67GHz Opteron (hex core) 112 x HP SL160 dual socket 2.67GHz Xeon (hex core) 180 x IBM dx340 dual socket 2.33GH Xeon (quad core) 384 x IBM dx340 dual socket 2.33GHz Xeon (quad core) 128 x Sun/Oracle X2200 dual socket 2.3GHz Opteron (quad core) 512 x Dell 1950e dual socket 2.32GHz Xeon (quad core) 256 x Sun/Oracle x2200 dual socket 2.3GHz Opteron (quad core) w/Myrinet 10G	17280	126400	1718800		145500
Cray XT5 (quad core 2.3 GHz Optron)	17956	125128	1367871		165195
NEC SX-9/E/1280M160	1280	122400	1556480		131072
HITACHI SR16000-M1/176(3830MHz)	5504	121600	1400000		168907
IBM Power 575 4.7 GHz (w/IB)	8064	115900	1128959		151603
IBM Power 775 IBM POWER7 3.836 GHz w/Custom	4608	114800	1184256		86395
Fujitsu FX1Quadcore SPARC64VII (Quad core 2.52GHz infiniband DDR)	12032	110600	3308800		121282
320 node iDataPlex (300 dual socket (8 core) Sandybridge plus 20 dual socket Sandybridge nodes w/dua l Intel Phi) SandyBridge E5-2670 (2.6 GHz) & Intel PHI 5110P w/Mellanox FDR	7520	110010	500000		14693
BM iDatPlex DX360M4 Compute nodes: (2 Intel	7056	104049	485000		138228

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
SandyBridge E5-2670 (2.6 GHz)) 18 IBM iDataPlex DX360M4 with 2x Phi Nodes: (2 Intel SandyBridge E5-2670 (2.6 GHz) 2 Intel PHI 5110P) w/ Mellanox CX3 Single-Port FDR HCA					
Intel Xenon E5-2650 (8 core, 2 GHz) + Nvidia M2050 + Infiniband (Node = 2 Socket + 3 GPU)	7424	98920	638975		148378
SGI Altix ICE 8200EX (Xeon quad core 3.0 GHz w/infiniband)	10240	106100	1535480		122880
Cluster Platform 3000 BL460c, Xeon 53xx 2.66GHz, Infiniband	13728	102800			181612
Cray XT3 Red Storm (AMD Opteron 2.4 GHz w/custom)	26569	102200	1700000		127531
T2K Open Supercomputer (Todai Combined Cluster) AMD Quad Core Opteron (2.3GHz) 4 sockets per node Myrinet-10G	15104	101700	1740800		139000
Cray XT3 dual-core Optron 2.6 Ghz	22592	101700	2220160		117478
HITACHI HA8000-tc/HT225 504nodes (2300MHz)	16128	100600	1152000		1483778
Intel Xeon					
IBM Power 575 4.7 GHz (w/IB)	6720	98240	1058399		126336
IBM Power 575 4.7 GHz (w/ IB)	6656	92980	960000		125133
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	32768	92960	1302527		111411
IBM eServer Blue Gene Solution (2way 0.7 GHz PowerPC 440 w/Custom)	40960	91290	983039		114688
Appro Xtreme-X (Opteron 8-core 2.4GHz QDR infiniband)	12512	91030	1630720		120115
IBM BladeCenter cluster HS21 (3.0 GHz Quad Core Intel Xeon w/ IB)	9920	89010	1778304		119040
Fujitsu PRIMERGY RX200S5, X5570 (2.93GHz Infiniband DDR)	8256	87890	1188864	129024	96760
TSUBAME Grid cluster and TSUBASA cluster TSUBAME: SunFire X4600 w/(Opteron 880 (2.4GHz) 2cores x 8sockets; NVidia GT200 (1.44GHz) 30multiprocessors x 1chip x 2boards; ClearSpeed CSX600 (210MHz) 1core x 2sockets x 1board) plus SunFire X4600 with ClearSpeed X620 w/(Opteron 880 (2.4GHz) 2cores x 8sockets ClearSpeed CSX600 (210MHz) 1core x 2sockets x 1board) TSUBASA: SunBlade X6250 68 nodes(Xeon E5440 (2.83GHz) 4cores x 2sockets)	30976	87010	1059839		161816
IBM Blue Gene/Q Prototype II (IBM BQC 1.6 GHz Nodes:512 Cores/node:16 w/custom)	8192	85879	983039		104857
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	32768	84310	1302527		111411
BullX Cluster (602 dual socket Intel X5650 2.67 GHz, 215 dual socket Intel X5550 2.67 GHz, 16 quad socket Intel X7560 w/InfiniBand)	9376	85900	1446480		99316
T2K Open Supercomputer (AMD Opteron quad-core, 2.3 GHz) w/ Myrinet 10G	12288	82980	1433600		113000
IBM BladeCenter cluster HS21 (3.0 GHz Quad Core Intel Xeon w/ IB)	9824	80940	1623744		117888
IBM Power 575 4.7 GHz (w/ IB)	6400	80320	1056000		120320
IBM Power 575 4.7 GHz (w/ IB)	6656	80000	1096000		125133
Dell C6100 670 nodes (Intel Xeon CPU X5670 2.93GHz (12-cores/node) w/Infinaband	8040	79800	1800000		94229

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM Power 575 4.7 GHz (w/IB)	5376	78680	907199		101068
TSUBAME Grid cluster and TSUBASA cluster TSUBAME: SunFire X4600 w/(Opteron 880 (2.4GHz) 2cores x 8sockets; NVidia GT200 (1.44GHz) 30multiprocessors x 1chip x 2boards; ClearSpeed CSX600 (210MHz) 1core x 2sockets x 1board) plus SunFire X4600 with ClearSpeed X620 w/(Opteron 880 (2.4GHz) 2cores x 8sockets ClearSpeed CSX600 (210MHz) 1core x 2sockets x 1board) TSUBASA: SunBlade X6250 68 nodes(Xeon E5440 (2.83GHz) 4cores x 2sockets)	30976	77480	995328		161816
T2K Open Supercomputer (Tsukuba) Appro Xtreme-X3 (AMD Opteron quad-core 2.3 GHz Infiniband 4X x 4 rail)	10000	76460	1508000		92000
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/GigE)	13440	76030	1808000		136013
IBM eServer pSeries p5 575 (8-way 1.9 GHz POWER5 w/HP Sw Interconnect)	12208	75760	1383600		92781
HITACHI SR16000-XM1/108(3300MHz)	3456	73350	1145440		91238.4
SuperMicro Xeon Cluster, E5462 4 core, 2.8 GHz, Nvidia Tesla s2050 GPU, (128 nodes; w/2 socket & 2 GPU / node) w/Infiniband	4608	75296	685567		143300
USC system (384 Sun x2200 2.3GHz AMD 2356, 512 Dell pe1950 2.3GHz Intel, Interconnect 10G Myrinet)	10240	72050	1285200		94208
IBM BladeCenter PS702 Express (IBM POWER7 3.00 GHz (Intelligent Energy Optimization enabled, up to 3.30 GHz) w/Infiniband) (245 nodes x 16 cores/node)	3920	72030	940800		103488
IBM eServer Blue Gene Solution (0.7 GHz PowerPC 440 w/custom interconnect)	32768	71900	884735		91750
IBM Power 775 IBM POWER7 3.836 GHz w/Custom	2816	70760	907776		86395
IBM BlueGene/L DD2 Prototype cluster (dual 0.7 GHz PowerPC 440 w/custom)	32768	70720	933887		91750
IBM Power 775 (IBM POWER7 3.836 GHz Interconnect: Custom)	2816	68320	710000		86395
IBM System x iDataPlex (2.26 GHz Quad Core Intel Xeon w/InfiniBand)	8000	66680	1610000		72320
IBM System x iDataPlex (2.26 GHz Quad Core Intel Xeon w/InfiniBand)	8000	66500	1554280		72320
IBM System x iDataPlex (2.26 GHz Quad Core Intel Xeon w/InfiniBand)	7992	65780	1374072		72248
Columbia - SGI Altix 1.5 GHz, Voltaire Infiniband	13608	66567	1478736		82944
IBM BladeCenter HX5 205 nodes (Intel Xeon E7-4870 (Westmere EX) 2.40 GHz (10 core) Cores: 8,000 (200 nodes * 4 sockets * 10 cores) w/Infiniband QDR	8000	64860	1099224		78720
Sun Blade 6048 (Xeon X5560 quad core 2.8 GHz w/Infiniband QDR)	6464	64630	1405152		72397
BladeCenter JS21 Cluster, PPC 970, 2.3GHz, Myrinet	10000	63830	1458000		92000
IBM eServer pSeries p5 575 (8-way 1.9 GHz POWER5 w/HPsw)	10240	63390	1280000		77824
IBM BladeCenter JS21 Cluster (PPC 970, 2.3GHz w/Myrinet)	10000	62630	1458000		92000
IBM Blue Gene Q Prototype (IBM BQC 1.6 GHz, 16 core, Interconnect Proprietary)	8192	65347	434175		104857
IBM Power 750 Express (POWER7 3.55 GHz (w/ Intelligent	2720	61260	1100000		83994

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Energy Optimization enable up to 3.86 GHz) w/10G Ethernet Nodes 85 4 sockets * 8 cores)					
252 nodes Dell PE1950 Xeon quad core 2.33 GHz plus 254 nodes Dell PE1950 Xeon quad core 2.33 GHz plus 255 nodes Sun X2200M2x64 Opteron quad core 2.3 GHz plus 254 nodes IBM iDataPlex DX340 quad core Xeon 2.33 GHz w/10G Myrinet	8120	60670	1156600		74704
IBM eServer pSeries p5 575 (8-way 1.9 GHz POWER5 w/HP Sw Interconnect)	9408	60490	1100000		72048
IBM Power 575 4.7 GHz (w/ IB)	4256	60030	800000		80013
IBM Power 575 4.7 GHz (w/IB)	4032	59250	816479		75801
IBM Power 750 Express (POWER7 3.55 GHz (w/ Intelligent Energy Optimization enable up to 3.86 GHz) Nodes 80 w/10G Ethernet)	2560	58310	1050000		79052
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/InfiniBand)	6720	56810	1256000		68006
Hitachi SR16000 Model 2 (POWER6 4.7GHz (32way), InfiniBand Fat Tree Network)	4096	56650	1100000		77004.8
SGI Altix 4700 (Itanium 1.6 GHz)	9614	56520	1583232		61530
TSUBAME Sun Fire X4600 (2.4 GHz Opteron 880 (648 nodes * 8 sockets * 2 cores) + 648 ClearSpeed accelerator cards * 2 CSX600 processors) w/Voltaire Infiniband)	11664	56430	1123200		102560
IBM Power 750 Express (POWER7 3.55 GHz (w/ Intelligent Energy Optimization enable up to 3.86 GHz)) w/10G Ethernet Nodes 80	2560	56200	1050000		79052
Xenon Systems 128 nodes, Dual quad core Xeon E5462, 2.8 GHz + NVIDIA Tesla S2050 w/infiniband	114688	52550	670000	335000	143308
IBM Power 575 4.7 GHz (w/IB)	3584	52810	767999		67380
NASA Project Columbia (20x508proc SGI Altix 3000 1.5 GHz Itanium2 w/Infiniband)	10160	51870	1290240		60960
SGI Altix 4700 (Itanium 1.6 GHz)	9108	51441	1260000		58291
HITACHI SR16000-L2/121(4700MHz)	3872	51210	844800		72794
BM Power 750 Express (86 nodes * 4 sockets * 8 cores) (POWER7 3.55 GHz (w/ Intelligent Energy Optimization enable up to 3.86 GHz) 10G Ethernet)	2752	50710	1100000		84982
T2K Open Supercomputer/Kyodai, HX600, Opteron Quad Core 2.3GHz, InfiniBand Fujitsu	6656	50510	1223040	215000	61235
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/InfiniBand)	6048	49900	1192000		61206
IBM Power 575 4.7 GHz (w/ IB)	3296	48550	950000		61965
IBM Power 575 4.7 GHz (w/ IB)	3520	47970	796000		66176
TSUBAME Sun Fire X4600 (2.6 GHz Opteron 885 (16 nodes * 8 sockets * 2 cores) + 2.4 GHz Opetron 880 (632 nodes * 8 sockets * 2 cores + 360 ClearSpeed accelerator cards * 2 CSX600 processors) w/Voltaire Infiniband)	11088	47380	1148160		82125
T-Platforms T-Blade solution Intel Xeon E5472 (quad core, 3GHz) w/InfiniBand	5000	47170	750000		60000
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	16384	46830	933887		55706

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Dell PE1955 dual-core Intel 2.66 Ghz blade w/2 sockets/node w/Mellanox Infiniband	5848	46730	1187200		62220
IBM BladeCenter cluster HS21 (2.5GHz Quad Core Intel Xeon L5420 w/ IB)	5376	46040	1113600		53670
IBM cluster (866 dual socket, 2.6 GHz Opteron, 87 quad socket, 2.6 GHz Opteron, 627 dual socket, 2.5 GHz Shanghai, 8 quad socket, QC 2.5 GHz Shanghai, with Infiniband)	9304	45730	1200000		73072
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/InfiniBand)	5376	45480	1124000		54405
Tsubame Sun Galaxy 4 (2.6 GHz Opteron 885 (16 nodes * 8 sockets * 2 cores) + 2.4 GHz Opetron 880 (632 nodes * 8 sockets * 2 cores + 360 ClearSpeed accelerator cards) w/Voltaire Infiniband)	10728	45200	971520		84429
IBM QPACE Cluster (3.2 GHz IBM PowerXCell8i with Custom Interconnect)	4608	44500	487551		55706
Cray XT3 dual-core Optron 2.6 Ghz	10404	43480	1064520		54101
IBM x3455 cluster (822 nodes dual socket dual core 2.6 GHz Opteron & 641 nodes dual socket dual core 2.5 GHz Shanghai w/ Infiniband)	8416	43460	591000		68378
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	16384	43160	909311		55706
Bull NovaScale 5160, Itanium2 1.6 GHz, Quadrics	8704	42900			55706
NASA Project Columbia (16x504proc SGI Altix 3000 1.5 GHz Itanium2 w/Infiniband)	8064	42707	1075200		48384
Dell 1955 (dual-core 2.66 GHz IB: Topspin/PCI-X)	5168	41460	1097600		54988
Dell PowerEdge C6100 cluster (2.66 GHz Six Core Xeon X5650 w/ IB)	4428	40310	1100000		47110
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/InfiniBand)	4704	39630	1051000		47604
IBM System x iDataPlex (2.8 GHz Quad Core Intel Xeon w/InfiniBand)	4104	38990	1190000		45965
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/GigE)	6720	38790	1256000		68006
Thunderbird - Dell PowerEdge 1850 (Pentium 3.6 GHz, Infiniband)	8000	38270	1150000		64512
Tsubame Sun Galaxy 4 (2.6 GHz Opteron 885 (16 nodes * 8 sockets * 2 cores) + 2.4 GHz Opetron 880 (632 nodes * 8 sockets * 2 cores) w/Voltaire Infiniband)	10368	38180	1334160		49869
IBM eServer Blue Gene Solution (2 way 0.7 GHz PowerPC 440 w/custom interconnect)	16384	37330	663551		45875
IBM Power 750 Express (POWER7 3.55 GHz w/ Intelligent Energy Optimization enable up to 3.86 GHz) (47 nodes * 4 sockets * 8 cores) Interconnect: Infiniband DDR	1504	36880	1100416		46443
IBM eServer BlueGene/L Solution (2way 0.7GHz PowerPC440 w/Custom interconnect)	16384	36490	688127		45875.2
Cray XT3 Red Storm (AMD Opteron 2.4 GHz w/custom)	10848	36190	1100000		43392
IBM BlueGene/L DD2 Prototype cluster (2way 0.7 GHz PowerPC 440 w/custom interconnect)	16384	36010	655359		45875
Earth Simulator ****	5120	35860	1075200	266240	40960
Dell PowerEdge 1950 (Intel Dural 2.33GHz Quad-core w/Infiniband)	5408	34780	761392	30000	50402
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon	4032	32980	974000		40804

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
w/InfiniBand)					
IBM QPACE Cluster (3.2 GHz IBM PowerXCell8i with Custom Interconnect)	3456	32850	421631		41779
Dell PowerEdge M600 (Intel quad core 2.33 GHz), w/Infiniband	4032	31800	1309280	158280	37578
IBM BladeCenter HS22 cluster (2.66 GHz Quad Core Intel Xeon w/InfiniBand)	7992	31310	752640		34048
IBM System x iDataPlex (2.8 GHz 6C Intel Westmere w/InfiniBand)	3072	30130	774144		34406
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/InfiniBand)	3360	28360	888000		34003
IBM eServer Blade Center JS20+ (2-way PowerPC970 2.2Ghz w/Myrinet)	4800	27910	977816		42144
Fujitsu RX200 S5 socket quad core Intel 2.266 GHz 10 GbE	6000	27777	1966080		54000
HP BL460c (Intel Xeon 3 GHz Quad core w/GigE)	5184	27720	1537920		62208
IBM eServer Blue Gene Solution (PowerPC 440 0.7 GHz w/Custom)	12288	27450	516095		34406
Intel (1100 node Woodcrest quad core 3 GHz w/Infiniband)	4400	27210	400000		52800
IBM System x iDataPlex (2.8 GHz Quad Core Intel Nehalem w/InfiniBand)	2592	27140	870912		29030
IBM System x iDataPlex (2.8 GHz Quad Core Intel Nehalem w/InfiniBand)	2512	26270	791280		28134
HP BL460c (Intel Xeon 3 GHz Quad core w/GigE)	4000	25530	1351040		48000
IBM BladeCenter cluster HS21 (2.66GHz Quad Core Intel Xeon w/GigE)	5040	24670	781600		53626
SGI Altix 4700 (Intel Itanium2 dual-core 1.6GHz w/SGI NUMAlink)	4096	23817	881664		26214
IBM Power 575 4.7 GHz (w/ IB)	1536	23470	768000		28876.8
IBM Power 595 p6 5.0 GHz w/ InfiniBand	1536	23370	684000		30720
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	8192	23270	651263		27853
System G 324 Mac Pro towers, dual quad core 2.8GHz Xeon w/Infiniband	2520	22320	545000		28224
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	8192	21910	602111		27853
Sun Constellation (quad core Intel Xeon X5570 2.93Ghz IB Mellanox)	2144	21330	551712		25128
T2K Open Supercomputer (Todai) AMD Opteron 8356 (quad core, 2.3GHz)	4096	21090	400000		37683
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	8192	20860	602111		27850
IBM eServer Blade Center JS20+ (2-way PowerPC970 2.2Ghz w/Myrinet)	3564	20530	812592	180576	31363
Cray XT3, (AMD Opteron 2.4 GHz w/custom)	5200	20527			24960
IBM System p p575 1.9GHz (w/HPS)	3072	20070	700000		23347
Intel Itanium2 Tiger4 (4-way) 1.4GHz Itanium2 w/Quadrics Elan4 (QsNetII)	4096	19940	975000	110000	22938
IBM BladeCenter cluster HS21 (3.0 GHz Dual Core Xeon 5160 w/ IB)	2080	19910	968000		24960
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/GigE)	3360	19580	900000		34003

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
NASA Project Columbia (8x512proc SGI Altix 3000 1.5 GHz Itanium2 w/Infiniband)	4032	19564	800000		24192
IBM BladeCenter cluster HS21 (3.0GHz Dual Core Xeon 5160 w/ IB)	2072	19550	900000		24860
Intel Itanium2 Tiger4 (4-way) 1.4GHz Itanium2 w/Quadrics Elan4 (QsNetII)	4032	19470	960000	110000	22579
IBM BladeCenter cluster HS21 (3.0GHz Dual Core Xeon 5160 w/ IB)	2072	19390	844000		24860
IBM BladeCenter cluster HS21 (3.0GHz Dual Core Xeon 5160 w/ IB)	2064	18730	660000		24770
IBM BladeCenter cluster HS21 (2.33 GHz Xeon 5140 w/ GigE)	3840	18600	600000		35790
IBM BladeCenter QS22 cluster (4.0 GHz "Prototype" IBM PowerXcell 8i w/ IB)	2016	18570	325375	115455	30464
Dell Cluster Intel Pentium Woodcrest (3 GHz w/Pathscale Infiniband)	2340	18270	713000		28080
IBM eServer Blue Gene Solution (2way 0.7 GHz PowerPC 440 w/Custom)	8192	18200	442367		22937.6
IBM eServer Blue Gene Solution, BlueGene/L (IBM PowerPC 700 MHz 440x5 processors w/Proprietary Interconnect)	8196	17810	675839		22940
IBM Blue Gene/L (0.7GHz Power PC440 w/ custom)	8192	17730	442367		22938
Cray XT3 Opteron dual core 2.6 GHz	4096	17280	598672		21420
SGI Altix XE 1300 Cluster Solution (512 Xeon 5355 quad-core 2.66GHz w/Infiniband DDRx)	2048	17250	638448		21791
IBM BladeCenter cluster HS21 (2.33GHz Quad Core Intel Xeon 5345 w/ IB)	2504	17140	720000		23337
IBM System x cluster (864 x3455 nodes and 86 x3755 nodes, 2.6 GHz Dual Core Opteron w/ IB)	4144	17100	670000		21549
IBM System x iDataPlex (2.53 GHz Quad Core Intel Xeon w/InfiniBand)	2016	17050	689000		20402
Sun Blade 6048 with X6420 blades (quad core AMD 2.0 GHz) w/Infiniband	3072	16990	854784		24576
Cray XT3, (AMD Opteron 2.6 GHz w/custom)	4096	16975			21299
Dell Cluster Intel Pentium Woodcrest (3 GHz w/Pathscale Infiniband)	2208	16570	698000		26496
Apple Xserve G5 (IBM PowerPC 970FX 2 GHz w/Myrinet)	3072	16180	750000	160000	24576
Intel (X5550 2.67 GHz dual-quad core w/Infiniband DDR)	1760	15890	759296	100000	18304
HITACHI SR11000-J2/128(2300MHz)	128	15811	645120	116640	18841
IBM System x iDataPlex (2.5 GHz Quad Core Intel Xeon w/ IB)	2048	15810	642000		20480
IBM BladeCenter cluster LS20 (2.2 GHz AMD Opteron w/ GigE)	6400	15760	840000		28160
Cray X1E (1.13 GHz)	1020	15706			18442
IBM BladeCenter QS22 cluster (3.2 GHz IBM PowerXcell 8i w/ IB)	2016	15700	325375	111615	24371
IBM System x cluster (2.6 GHz Dual Core Opteron w/ IB)	4144	15350	560000		21550
IBM BladeCenter cluster HS21 (2.33GHz Quad Core Intel Xeon 5345 w/ IB)	2120	15290	483000		19758
IBM BladeCenter cluster HS21 (2.33 GHz Xeon 5140 w/ GigE)	3072	15160	550000		28630

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Fujitsu PRIMERGY RX200S3 (3.0 GHz Dual Core Xeon 5160 w/ IB)	1536	15090	500000	95000	18432
IBM eServer BladeCenter JS21 (4way PowerPC 970 2.5GHz w/Myrinet)	2016	15040	653184	145152	20160
Cray X1E (1.13 GHz)	1014	14955			18333
IBM BladeCenter cluster HS21 (2.66GHz Quad Core Intel Xeon 5355 w/ IB)	1792	14910	588672		19067
Intel Xeon X5550, Quad core 2.67GHz Infiniband DDR	1568	14710	704000`	100000	16746
SGI Altix 4700 (Itanium 1.6 GHz)	2540	14593	483800		16256
IBM eServer Blade Center JS20+ (2-way PowerPC970 2.195Ghz w/Myrinet)	2520	14550	670320		22126
Cray XT3 (AMD Opteron 2.4 GHz w/custom)	3700	14170	452000		17760
IBM System x3755 cluster (2.2 GHz AMD Dual Core Opteron w/ IB)	4576	14070	1000000		20130
IBM BladeCenter QS22 cluster (3.2 GHz IBM PowerXcell 8i w/ IB)	1800	13990	309759	104063	21760
IBM System p p575 (1.9 GHz w/HPS)	2240	13990	550000		17024
ASCI Q AlphaServer EV-68(1.25 GHz w/Quadrics)	8160	13880	633000		20480
IBM iDataPlex DX360M2 Westmere (2.4 GHz 6 core) + 504 nVIDIA M2070 Nodes 252 w/InfiniBand	3024	137600	1150000		288691
IBM eServer pSeries p5 575 (8-way 1.9 GHz POWER5 w/HPSw)	2048	13090	806400	54000	15565
IBM p5 575 (1.5 GHz w/ HPS)	2560	12940	600000		15360
Dell PowerEdge Cluster 1955 (Intel dual core 2.67 GHz w/GigE)	2520	12510	750000		13459
Apple XServe platform (1100 dual 2.3 GHz IBM PowerPC 970 w/Mellanox Infiniband and Cisco Gigabit Ethernet secondary fabric)	2200	12250	620000		20240
T-Platforms T-Blade solution Intel Xeon E5472 (quad core, 3GHz) w/InfiniBand	1328	12200	380000		15936
SGI Altix 4700 (Itanium 1.6 GHz) 4	2024	12072	655872		12954
SGI Altix 4700 (1.6 GHz Itanium2 dual-core w/SGI NUMAlink4 within nodes and between nodes 4x256)	2016	11913	440832		13107
SGI Altix 3700 Bx2 (1.6 GHz Itanium2 configured 16x128 SGI NUMALink)	2016	11814	494592		12902
Apple XServe platform (1080 dual 2.3 GHz IBM PowerPC 970 w/Mellanox Infiniband and Cisco Gigabit Ethernet secondary fabric)	2160	11770	590000		19872
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	4096	11710	466943		13926
IBM BlueGene/L DD1 Prototype (0.5 GHz PowerPC 440 w/custom)	8192	11680	331775		16384
SGI Altix 3700 (Itanium Bx2, 1.6 GHz, NUMALink)	2024	11652	440832		12954
SGI Altix 3700 Bx2 (1.6 GHz Itanium2 configured 4x512 SGI NUMALink)	2016	11636	440832		12902
IBM System p p575 1.9GHz (w/IB) 2	1920	11470	576000		14590
IBM Blue Gene Solution, BlueGene/P (IBM PowerPC 850 MHz 450 processors w/Proprietary Interconnect)	4092	11320	466943		13500
IBM BladeCenter cluster HS21 (3.0 GHz Dual Core Intel Xeon 5160 w/ IB)	1280	11230	518400		15360

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM BladeCenter cluster HS21 (3.0GHz Dual Core Xeon 5160 w/ IB)	1360	11170	537200	85000	16320
IBM System Blue Gene/P Solution (Quad core 0.85 GHz PowerPC 450 w/Custom)	4096	11110	466943		13930
IBM BladeCenter QS22 cluster (3.2 GHz IBM PowerXcell 8i w/ IB)	1512	11110	273919	94591	18278
Apple XServe platform (1024 dual 2.3 GHz IBM PowerPC 970 w/Mellanox Infiniband and Cisco Gigabit Ethernet secondary fabric)	2048	10930	520000		18841.6
Fujitsu PRIMEQUEST580 (1.6GHz Dual Core Itanium2 w/ IB)	2048	10850	580000	100000	13107
Intel WA Endeavor (285 node Woodcrest 2-dual core 3 GHz w/Infiniband)	1140	10770	512000		13680
Sun Constellation (quad core Intel Xeon X5570 2.93Ghz IB Mellanox)	2112	10720	200000		24752
IBM System p p575 1.9GHz (w/IB)	1920	10610	576000		14592
PACS-CS (Hitachi and Fujitsu) Intel Xeon (2.8 GHz w/GigE)	2560	10350	722944		14336
IBM eServer pSeries 655 (8-way 1.7 GHz POWER4+)	2880	10310	400000		19584
Apple G5 dual 2.0 GHz IBM Power PC 970s, w/Infiniband 4X primary fabric, Cisco Gigabit Ethernet secondary fabric	2200	10280	520000	152000	17600
Dell PowerEdge 1750, P4 Xeon 3.06 GHz, w/Myrinet	2500	9819	630000		15300
BlueGene/L DD2 Prototype (dual PowerPC 440 0.7 GHz)	4096	9433	479231		11469
BlueGene/L DD2 Prototype (dual PowerPC 440 0.7 GHz)	4096	9360	331775		11469
IBM System Cluster 1350 2.33GHz Intel Xeon 5345 (w/GigE)	1536	9287	616000		14315
IBM eServer pSeries 690 (32 way 1.9 GHz POWER4+)	2176	9241	370000		16538
Fujitsu PFU RG1000 (1.5GHz Core2Duo w/ GbE)	2048	9045	487680	180480	12288
HITACHI SR11000-K1/80 (2.1 GHz)	80	9036	547200		10752
IBM eServer pSeries 690 (32 way 1.9 GHz POWER4+)	2112	8955	350000		16051
HITACHI SR11000-K1/80(2.1 GHz)	80	8893	489600		10752
RIKEN Super Combined Cluster(dual Xeon 3.06GHz multiple clusters w/(1x512-1x128-InfiniBand4X; 3x128-Myrinet)GigE secondary)	2048	8728	474200	120000	12534
HP RX2600 Itanium 2 1.5GHz w/Quadrics	1936	8633	835000	140000	11616
HP 256 Intel Xeon Processor E5472 (3 GHz w/Infiniband)	1024	8616	301056		12288
IBM BladeCenter cluster AMD Opteron LS20 (2.0 GHz AMD Opteron w/ GigE)	3920	8509	660000		15680
SGI Altix 3000 (Itanium 1500 MHz 4 clustered w infiniband)	2016	8397	600000		12100
IBM System x3550 cluster (2.66GHz Dual Core Intel Xeon 5160 w/ IB)	1008	8368	333000		10725
HP xw8600 workstations Intel X5450 @ 3GHz Infiniband 4x	864	8295	645000		10368
IBM System x3455 cluster (2.6 GHz AMD Dual Core Opteron w/ IB)	2080	8210	299520		10820
IBM BladeCenter cluster HS21 (2.66 GHz Quad-core Intel Xeon 5355 w/ IB)	1024	8189	320000		10895
IBM eServer pSeries 690 (32 way 1.9 GHz POWER4+)	2048	8174	360000		15565
Dawning 4000A (quad Opteron 848 2.2Ghz w/Mirinet2000)	2560	8061	728480	180000	11264
AMD Opteron 2 GHz, w/Myrinet	2816	8051	761160	109208	11264
Intel Xeon 3.2GHz w/Myrinet	1536	7737	4000000		9830

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
ASCI Q AlphaServer EV-68 1.25 GHz w/Quadrics	4096	7727	590000	126100	10240
ASCI Q AlphaServer EV-68 1.25 GHz w/Quadrics	4096	7679	576000	138600	10240
Linux NetworX/Quadrics(2.4 GHz Xeon w/Quadrics)	2304	7634	350000	75000	11059
Intel Xeon x5355 Quad-core (2.66 GHz w/InfiniBand)	1024	7500	300000		10895
IBM eServer pSeries p5 575 (16-way 1.5 GHz dual core POWER5 w/HP sw)	1536	7395	400000		9216
IBM SP Power3 416 nodes 375 MHz	6656	7304	640000		9984
ASCI White-Pacific, IBM SP Power 3(375 MHz)	8000	7226	518096	179000	12000
IBM eServer Itanium2 (248 dual 1.3 GHz & 640 dual 1.5 GHz w/Myrinet)	1776	7215	540000		10259
IBM eServer Opteron e325 (2 way, 2.2 GHz AMD Opteron w/Myrinet)	2320	7185	600000		10208
Dell 1855 blade system (dual 3.2 GHz Intel EM64T, InfiniBand TopSpin)	1300	6989	442624		8320
IBM Power 795 (4.00 GHz POWER7, RHEL 6, Intelligent Energy Optimization enabled, up to 4.14 GHz)	256	6902	427776	22888	8487
Dell PowerEdge SC1425 (2 way Intel Xeon EM64T 3.60GHz w/Infiniband)	1140	6888	650000		8208
Fujitsu PRIMEPOWER HPC2500 (2.08GHz)	1664	6860	850720	118326	13844
Intel WA Endeavor (232 node Woodcrest 2-dual core 3 GHz w/Infiniband)	928	6855	430000		11136
IBM Power 795 (4.00 GHz POWER7, SLES 11 SP1)	256	6830	427776	22888	8487
IBM eServer pSeries p5 575 (16-way 1.5 GHz dual core POWER5 w/High Perf Sw)	1472	6748	500000		8832
IBM Power 795 (4.0 GHz POWER7)	256	6653	360000	58000	8486
Dell PowerEdge SC1425 (2 way Intel Xeon EM64T 3.60GHz w/Infiniband Topspin)	1152	6615	600000	300000	8294
IBM BladeCenter cluster HS21 (3.0 GHz Dual Core Intel Xeon 5160 w/ GigE)	1760	6521	404800		21120
IBM/Quadrics (2.4 GHz Xeon w/Quadrics QsNet)	1920	6586	425000	90000	9216
IBM eServer pSeries 690 (32 way 1.7 GHz POWER4+)	1664	6363	360000		11315
HITACHI SR11000-K2/50(2300MHz)	50	6272	450000		7360
IBM eServer 1350-xSeries 335 (2 way 3.06 GHz Xeon w/Quadrics)	1456	6232	400000	67000	8911
IBM eServer pSeries 690 (32 way 1.7 GHz POWER4+)	1600	6188	355000		10880
IBM eServer Opteron e325 (AMD Opteron 2.0 GHz w/Myrinet)	2048	6155	678912		8192
SGI Altix 3700 (Itanium Bx2, 1.6 GHz, NUMALink)	1012	6028	440832		6477
SGI Altix 4700 (Intel Itanium2 dual-core 1.6GHz w/SGI NUMAlink)	1024	6015	423360		6554
SGI Altix 3700 (Itanium Bx2, 1.6 GHz, NUMALink, 10GigEthernet)	1016	6007	573888		6502
IBM eServer pSeries p5 575 (8-way 1.9 GHz POWER5 w/HP Sw Interconnect)	896	5917	480000		6810
Cray X1 (800 MHz)	504	5895	494592	53760	6451
IBM eServer pSeries p5 575 (8-way 1.9 GHz POWER5 w/HP Sw Interconnect)	864	5735	532800		6566
IBM eServer Blade Center JS20+ (2-way PowerPC970 2.195Ghz w/Myrinet)	1024	5659	440000		8991

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM eServer pSeries 690 (41x32 way 1.7 GHz POWER4+)	1312	5568	660000	60000	8921
Dell Power Edge 1855 (2-way Intel Xeon 3.60GHz EM64T w/GigE)	1260	5439	200000		9072
Fujitsu PRIMEPOWER HPC2500(1.3GHz)	2304	5406	658800	100080	11980
MVS-15000BM Cluster IBM JS20 (dual IBM PowerPC 970FX - 2.2 GHz w/Myrinet)	924	5355	415800	110000	8131
Cray X1 (800 MHz)	441	5156	451584	48384	5645
IBM BladeCenter cluster LS21 (2.6 GHz AMD Opteron w/Voltaire 4X Infiniband)	1136	5005	410000		5907
HITACHI SR11000-J1/50 (1.9 GHz)	50	4993	396000		6080
IBM System x3550 cluster (3.0GHz Dual Core Intel Xeon 5160 w/ 10G Myrinet)	512	4919	349440		6144
HP RX2600 Itanium 2 (1GHz w/Quadrics)	1540	4881	550000	110000	6160
Cray XT3 (AMD Opterons 2.6 Ghz w/custom)	1100	4782	349760		5720
IBM e326 cluster (2.8 GHz AMD Dual Opteron w/ Myrinet)	1024	4754	522240		5734
IBM BlueGene/L DD2 Prototype (0.7 GHz PowerPC 440)	2048	4713	233471		5734
Cray X1 (800 MHz)	400	4684	440320	43520	5120
SGI Altix 4700 (dual-core Itanium2 1.6GHz w/SGI NUMAlink)	768	4603	387072		4915
HITACHI SR11000-K1/40 (2.1 GHz)	40	4596	446400		5376
Fujitsu PRIMERGY RX200 (Xeon 3.06GHz/Infiniband 4X)	1024	4564	485568	91584	6266
IBM BladeCenter cluster HS21 (2.33 GHz Xeon 5140 w/ GigE)	768	4554	280000		7158
Fujitsu PRIMEPOWER HPC2500 (Sparc 1.56GHz)	1472	4552	749340	90390	9185
HP 256 Intel Xeon Processor E5472 (3 GHz w/Gigabit)	1024	4547	401408		8640
IBM System x3455 cluster (2.6 GHz AMD Dual Core Opteron w/ IB)	1024	4517	460000		5325
Compaq AlphaServer SC ES45/EV68 1GHz	3016	4463	280000	85000	6032
IBM BladeCenter cluster (2.2 GHz AMD Opteron w/ Infiniband SDR)	1152	4379	700000		5069
IBM eServer pSeries 655 (8-way 1.7 GHz POWER4+)	1152	4379	450000	60000	7833.6
IBM eServer pSeries p5 575 (dual core 16-way 1.5 GHz POWER5 w/Myrinet)	1024	4307	515000		6144
Dell PowerEdge 1750 (dual Xeon 3.2 GHz w/Myrinet)	1020	4298	420000		6528
Legend DeepComp 6800, Itanium2 1.3 GHz QsNet	1024	4193	491488	120000	5324.8
IBM pSeries p690 Turbo (1.3 GHz 50 servers/32 processors/server) 2 planes Colony switch	1600	4184	550000	93000	8320
Dell 1855 blade, Intel Irwindale dual 3.2 GHz w/InfiniBand w/MS Windows	896	4106	440000		5734
IBM BladeCenter cluster LS21 (2.6 GHz AMD Opteron w/ Votaire 4X Infiniband)	1024	4099	180000		5325
Compaq AlphaServer SC ES45/EV68 1GHz	3024	4059	525000	105000	6048
Linux NetworX/Quadrics(2.4 GHz Xeon w/Quadrics)	1900	4049	350000	75000	9120
Compaq AlphaServer SC ES45/EV68(1GHz w/Quadrics)	2560	3980	360000	85000	5120
Dell PowerEdge 1750 (dual Xeon 3.2 GHz w/Myrinet)	992	3975	300000		6349
HP Proliant DL140 G3 (dual processor dual core Intel Xeon 3GHz 5160 nodes w/Infiniband 4X DDR)	512	3859	320000		6000
IBM eServer pSeries p5 575 (16-way 1.5 GHz dual core POWER5 w/HP sw)	768	3851	300000		4608

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM eServer pSeries 655 (8 way 1.5 GHz POWER4+)	1024	3812	428800	42400	6144
IBM Power 795 (4.25 GHz POWER7, SLES 11 SP1, TurboCore mode enabled)	128	3784	427776	20429	4358
EDA Express (2.4-2.8 GHz AMD x86-64 Opteron - 816 cores from IBM plus 384 cores from HP w/GigE)	1200	3782	352000		5760
IBM eServer 1350-xSeries 335 (dual 3.06 GHz Xeon w/GigE)	1000	3755	390000		6120
IBM eServer pSeries 655 (8 way 1.5 GHz POWER4+)	1008	3686	403200	40000	6048
IBM Power 795 (4.25 GHz POWER7)	128	3676	260000	48000	4358
IBM JS21 Blade Center (128 PowerPC 970 2.5 GHz, 128 nodes 4proc/node w/Myrinet)	512	3637	331776	69632	5120
Intel Xeon 3 GHz dual core w/Murinet 2000	544	3601	241684		6528
IBM Power 780 (3.7 GHz POWER7+, RHEL 6.3, Intelligent Energy Optimization enabled, up to 4144 MHz)	128	3575	321451	21000	4243
Cray X1 (800 MHz)	300	3522	376320	38400	3840
IBM pSeries 690 Turbo 1.3GHz	1280	3406	317000		6656
IBM eServer pSeries p5 575 (8-way 1.9 GHz POWER5 w/HP Sw Interconnect)	512	3392	320000		3891
HPTi Intel Xeon(2.2 Ghz,dual w/Myrinet)	1536	3337	285000	75000	6758
HITACHI SR11000-H1/56 (1700MHz)	896	3310	413280	52920	6093
HITACHI SR11000-H1/50(1700MHz)	50	3295	392400	49860	5440
Dell PowerEdge 1850 (Xeon EM64T 3.2 GHz w/Infiniband)	896	3256	148224		5734
IBM p575+ 32 nodes w/16 processor SMP/node	512	3247	392000		3891.2
IBM eServer 1350-xSeries 335 (2 way 3.06 GHz Xeon w/Myrinet-2000)	768	3231	301000	59000	4700
IBM p690 cluster, Power 4 1.3 GHz	1200	3210	300000		6240
HP CP3000 (576 Intel Xeon Processor X3.6GHz/800-2MB w/Infiniband)	576	3059	300000		4082
SGI Altix 3700 Bx2 (Itanium2, 1.6 GHz 9MB)	510	3073	312480		3264
SGI Altix 4700 (dual-core Itanium2 processors @ 1.6 GHz w/SGI NUMAlink)	512	3071	311808		3277
IBM eServer pSeries 570 (8 way 1.9 GHz POWER5 w/GigE)	720	3068	375500		5472
Dell Cluster Pentium 4 (3.2 GHz, w/GigE)	860	3064	460000		5504
IBM eServer HS20 cluster (2 way 3.2GHz Intel Xeon EM64T w/GigE)	1000	3059	326000		6400
IBM SP Power3 208 nodes 375 MHz	3328	3052	371712		4992
HP Cluster (Dual Intel Quad Core Xeon EM64 processor w/Infiniband)	320	2999	224128		3943
HP Cluster (Dual Intel Quad Core Xeon EM64 processor w/Infiniband)	320	2976	202144		4044
IBM eServer Blade Center JS20 (2-way PowerPC970 2.2Ghz w/Myrinet)	504	2948	310000		4435.2
Cray X-1 (800 MHz)	252	2932.9	338688	44288	3225.6
Compaq Alphaserver SC ES45/EV68(1GHz w/Quadrics)	2048	2916	272000		4096
NEC SX-8/192M24 (24 nodes 8 proc/node)	192	2914	431616		3072
HITACHI SR11000-H1/50 (1700MHz)	800	2909	396000	84600	5440

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
SGI Altix 3700 Bx2 (1.5 GHz Itanium2 configured 18x64 GigE)	1200	2887	336000		7200
SGI Altix 3700 Bx2 (1.5 GHz Itanium2)	510	2869	317520		3060
Dell 1855 blade system (dual 3.2 GHz Intel Irwindale w/MS, InfiniBand)	854	2864	300000		5466
IBM Xeon Cluster 2.4 MHz w/ Myrinet	1024	2847	230000		4915
IBM eServer Blade Center JS20+ (2-way PowerPC970 2.195Ghz w/Myrinet)	528	2816	320000		4635.84
Cray X-1 (800 MHz)	240	2793.2	337920	43264	3072.0
IBM eServer Opteron e326 Cluster (2 way, 2.4 GHz AMD Opteron w/GigE)	920	2791	417430		4416
IBM eServer Opteron e326 Cluster (2 way, 2.4 GHz AMD Opteron w/InfiniBand)	704	2724	337920		3379
Cray X-1 (800 MHz)	234	2719.0	329472	44544	2995.2
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	1056	2713.0	240000		5491
Cray X-1 (800 MHz)	225	2614.2	330240	38400	2880.0
HP Cluster (Dual Intel Quad Core Xeon EM64 processor w/Infiniband)	320	2614	129408		3940
Cray X-1 (800 MHz)	224	2609.5	329728	38912	2867.2
IBM eServer HS20 cluster (2 way 3.2GHz Intel Xeon EM64T w/GigE)	640	2554	272009		4096
Dell PowerEdge 1850, Xeon EM64T (3.2 GHz w/Myrinet)	784	2540	200000		5017
IBM SP Power3 158 nodes 375 MHz	2528	2526.	371712	102400	3792
IBM Power 780 (3.44 GHz POWER7, SLES 11 SP1, Intelligent Energy Optimization enabled, up to 3.780 GHz)	96	2512	310176	15508	2903
Cray X-1 (800 MHz)	220	2481	317440		2816
Intel dual Pentium Xeon (3.06 GHz w/Myrinet)	598	2455	252000		3660
SGI Altix 3000 (1500 MHz Itanium 2)	510	2439	252960		3060
Cray X-1 (800 MHz)	208	2416.5	292864	38912	2662.4
ASCI Red Intel Pentium II Xeon core 333MHz	9632	2379.6	362880	75400	3207
Cray X-1 (800 MHz)	252	2368	135555		3226
SGI Altix 3000 (1.3 GHz Itanium2)	496	2338	193536		2579
IBM p690 cluster, Power 4 1.3 GHz	864	2310	275000	62000	4493
Dell Power Edge 1855 (2-way Intel Xeon 3.60GHz EM64T w/Infiniband)	420	2303	529200		3024
Cray X-1 (800 MHz)	196	2276.4	301056	34304	2508.8
IBM BlueGene/L DD2 Prototype (0.7 GHz PowerPC 440 w/custom)	1024	2220	172031		2867
Atipa Tech. Pentium 4 (1.8 GHz w/Myrinet)	1024	2207.	280000	56000	3686
NEC SX-6/248M31(typeE) (1.77ns)	248	2155	220224	22816	2894.16
ASCI Blue-Pacific SST, IBM SP 604E(332 MHz)	5808	2144.	431344	432344	3868
Dell PE1855 blade (dual 3.2GHz Intel 64-bit Xeons w/ Topspin Infiniband)	400	2141	290560		2560
ASCI Red Intel Pentium II Xeon core 333MHz	9472	2121.3	251904	66000	3154
Apple Xserve G5 (dual 2.0 GHz w/Myrinet)	448	2104	221376	64000	3584
Cray X-1 (800 MHz)	180	2099.9	291840	34816	2304.0
Compaq Alphaserver SC ES45/EV68 1GHz	1520	2096	390000	71000	3040

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM eServer Intel Tiger4 (quad 1.3GHz Itanium2 w/Myrinet)	512	2082	490160		2662
Apple Xserve G5 (dual 2 GHz IBM Power PC 970)	448	2073	220032		3584
Intel (dual-core Xeon 3.2 GHz w/IB switch)	448	2060	230000		2867
NEC SX-8R/64M8	64	2056	352256		2253
Compaq Alphaserver SC ES45/EV68 1.25GHz	1024	2037	320000		2560
Fujitsu M9000 (SPARC64 VII 2.52GHz, quad core)	256	2032.0	268128	46000	2580.48
Sun M9000 (SPARC64 VII 2.52GHz, quad core)	256	2032.0	268128	46000	2580.48
Self-made AMD Opteron dual (2.2GHz w/Infiniband)	576	2028	274000	24950	2534
IBM eServer Cluster HS20 (2.8 GHz Xeon w/GigE)	610	2026	340600		3416
HP-DL580-G5 (Intel Xeon (Tigerton) 2.933 GHz quad core quad processor X7350 nodes w/10Gbps PARAMNet-3)	256	2013	351232		3000
IBM eServer HS20 cluster (2 way 3.2GHz Intel Xeon EM64T w/GigE)	640	2010	272009		4096
PowerEdge HPC Cluster (2.4 GHz Xeon w/GigE)	600	2004.	253400	42200	2880
IBM p690 cluster, Power 4 1.3 GHz	768	2002	252000		3994
Self made (256 nodes dual 3.06GHz Intel Xeon w/ GigE)	512	1997	331968		3133
Linux Networx (dual 3.06GHz Intel Xeon processor w/GigE)	512	1997	331968		3133
Fujitsu-Siemens hpcLine (Xeon "Nocona" 64-bit 3.2GHz w/InfiniBand)	400	1978	220000	3200	2560
IBM Power 575 (4.7 GHz POWER6 SLES 10 SP2)	128	1975	200000	22500	2406.4
Cray X-1 (800 MHz)	169	1965.9	281216	31616	2163.2
BM Power 770 (3.8 GHz POWER7+, RHEL 6.3, Intelligent Energy Optimization enabled, up to 4312 MHz)	64	1948	336384	14750	2208
IBM AMD Opteron (2.2 GHz w/Infiniband)	600	1930	400000		2640
Apple Xserve G5 (dual 2 GHz IBM Power PC 970)	440	1911	208896		3520
SGI Altix 3000 (Itanium 2, 1.3 GHz)	416	1793	298799	298799	2163
IBM SP 112 nodes (375 MHz POWER3 High)	1792	1791	275000	275000	2688
IBM Power 780 (3.86 GHz POWER7, RHEL 6, Intelligent Energy Optimization enabled, up to 3.94 GHz)	64	1772	224256	11700	2021
IBM eServer Cluster 1350-xSeries 335 2.8 GHz Xeon w/Myrinet	512	1762	240000	37000	2867
IBM p690+ POWER4+ (1.7 GHz w-plane SP Switch2)	544	1760	400000		3699
IBM xSeries x335 (dual 2.4 GHz Intel Xeon w/GigE)	1024	1755	335000	41600	4915
IBM eServer pSeries 690 (32 way 1.9 GHz POWER4+)	352	1714	372000		2675.2
HITACHI SR8000/MPP/1152(450MHz)	1152	1709.1	141000	16000	2074
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	624	1696.0	221000		3245
Cray X-1 (800 MHz)	144	1676.9	258048	29184	1843.2
IBM xSeries Cluster Dual Xeon 3.06 GHz w/Myrinet	486	1667	213120		2974
HITACHI SR8000-F1/168(375MHz)	168	1653.	160000	19560	2016
IBM eServer Intel Tiger4 (4 way 1.3 GHz Itanium2 w/Myrinet)	512	1636	430079		2662
IBM eServer pSeries 655 (8 way 1.7 GHz POWER4+ w/GigE)	544	1636	335000		3699.2
ASCI Red Intel Pentium II Xeon core 333Mhz	6720	1633.3	306720	52500	2238
IBM eServer Intel Tiger4 (4 way 1.3 GHz Itanium2	500	1616	419999		2600

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
w/Myrinet)					
SGI ASCI Blue Mountain	5040	1608.	374400	138000	2520
IBM eServer Cluster HS20 (2.8 GHz Xeon w/GigE)	480	1602	275600		2688
Dell PowerEdge 1850s (dual 3.2 GHz Intel EM64T w/Myrinet)	400	1578	190000		2560
IBM eServer (Opteron 2.2 GHz w/Infiniband)	576	1575	200000		2534.4
NEC SX-6/192M24	192	1484	200064	16128	1536
IBM eServer pSeries 655 (4 way 1.7 GHz POWER4+)	384	1477	174000	40000	2611
Cray X-1 (800 MHz)	126	1473.3	241920	30080	1612.8
IBM eServer (Opteron 2.2 GHz w/Infiniband)	484	1447	200000		2129.6
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4 w/Federation)	512	1456.0	307200		2662
IBM BlueGene/L Test Prototype, PowerPC 440 500MHz (custom processor/interconnect)	1024	1435	98304		2048
IBM eServer pSeries 690 Turbo (1.7 GHz POWER4+)	384	1424	325000		2611.2
IBM SP 328 nodes (375 MHz POWER3 Thin)	1312	1417.	374000	374000	1968
Cray X-1 (800 MHz)	121	1411.1	239360	26240	1548.8
SGI Altix 3700 (1.5 GHz Itanium2)	255	1405	211680		1530
MVS-5000BM Cluster IBM JS20 (dual IBM PowerPC 970 - 1.6 GHz w/Myrinet)	330	1401	280000	45000	2112
Cray X-1 (800 MHz)	120	1400.4	230400	26496	1536.0
IBM xSeries 335 cluster (dual 3.06GHz Xeon w/InfiniBand)	384	1389	120000		2350
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4 w/Colony)	512	1384.0	200000		2662
NEC SX-7/160M5(1.81ns)	160	1378	200000	15200	1412.8
Dell PowerEdge 1850 (Xeon 64 3.2GHz w/Topspin InfiniBand)	256	1349	220440	110220	1638
Intel ASCI Option Red (200 MHz Pentium Pro)	9152	1338.	235000	63000	1830
Legend DeepComp 1800 (2GHz Pentium 4 w/Myrinet)	512	1297	172000		2048
Self Made Pentium4 Xeon (80-3.06 GHz, 72-2.8 GHz, 112-2.4 GHz, 256-2.2 GHz w/GigE)	520	1283	260000		2557
Intel EM64T (2 way 3.2 GHz Intel EM64T w/Myrinet D)	256	1269	241920		1638
IBM Power 760 (3.4 GHz POWER7+, AIX, Intelligent Energy Optimization enabled, up to 3.787 GHz)	48	1268	217600	9344	1454
IBM Power 760 (3.4 GHz POWER7+, SLES11SP2, Intelligent Energy Optimization enabled, up to 3.787 GHz)	48	1259.0	232223	9600	1454
HP Integrity rx2600 Itanium2 (1.3 GHz w/Myrinet)	304	1253	256000		1580
IBM eServer (Opteron 2.2 GHz w/Infiniband)	400	1246	200000		1760
IBM eServer HS20 cluster (2 way 3.2GHz Intel Xeon EM64T w/Myrinet)	252	1196	160922		1612.8
NEC SX-5/128M8(3.2ns)	128	1192.0	129536	10240	1280
SGI Altix 4700 (Intel Itanium2 (Montvale) @ 1.66 GHz processor cores w/NUMAlink interconnect)	200	1183	164640	32000	1328
IBM xSeries Cluster Dual Xeon (3.06 GHz w/Myrinet)	490	1172	180000		1499
Visual Technology SuperNova / AMD Opteron 1.8 GHz GigtEth	512	1169.0	220000	59000	1843.2

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Cray X-1 (800 MHz)	100	1167.1	217600	23040	1280.0
SGI Altix Itanium 2 1300 MHz	256	1142	334080	46000	1331.2
NEC SX-6/128M16(1.77ns)	128	1141.0	327680	8960	1152
HP rx2600 Itanium2 (1.3 GHz w/Myrinet)	304	1137	240000		1580.8
Bull NovaScale 5160 16x16 Itanium2 1.3GHz w/Quadrics Elan 4	256	1131	335872	32000	1331
NEC SX-6/144M18 (2 ns)	144	1130	225216	11232	1152
IBM eServer Opteron e325 Cluster (2 way, 2.2 GHz Opteron w/Myrinet)	352	1128	185800		1548.8
CRAY T3E-1200 (600 MHz)	1488	1127	148800	28272	1786
IBM eServer Opteron e325 Cluster (2 way, 2.2 GHz AMD Opteron w/Myrinet)	352	1120	185000		1548.8
IBM eServer pSeries 655 (32x8-way 1.7 GHz POWER4+)	256	1107	224000	14000	1740.8
IBM eServer Blade Center Cluster HS20 (dual 3.2 GHz Xeon EM64T w/GigE)	252	1104	160000		1613
Dell 1750 cluster Intel Xeon (dual 3.06 GHz w/Gnet)	304	1095	175000	40000	1860
Intel P4 Xeon (3.06 GHz w/Myrinet 2000)	252	1084	247000	38000	1542
Intel ASCI Option Red (200 MHz Pentium Pro)	7264	1068.	215000	53400	1453
Linux Networx dual Intel Xeon (3.06GHz w/Myrinet)	256	1060	159432	29858	1566.72
IBM AVIDD-B+AVIDD-I(2.4 GHz Xeon Force10)	384	1058.	220000		1843
Linux Networx Dual AMD Opteron (1.8 GHz w/Infiniband)	512	1053	114000	22202	1843
Cray X-1 (800 MHz)	90	1050.1	195840	23808	1152.0
IBM Power 595 (5.0 GHz POWER6 SLES 11)	64	1050	130000	9500	1280
IBM xSeries Cluster Xeon 2.4 GHz w/Gig-E	448	1040	195000		2150
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	384	1038.	245000		1997
Intel Pentium 4 dual-Xeon 2.8Ghz w/Quadrics Elan3	256	1036	170000	30600	1434
HITACHI SR8000-F1/112(375MHz)	112	1035.0	120000	15160	1344
IBM eServer Opteron e325 Cluster (2 way, 2.0 GHz AMD Opteron w/GigE)	432	1034	215000		1728
Fujitsu SPARC Enterprise M9000 (2.4 GHz dual core)	128	1032.0	331045	48108	1228.8
Sun SPARC Enterprise M9000 (2.4 GHz dual core)	128	1032.0	331045	48108	1228.8
IBM Power 595 (5.0 GHz POWER6 RHEL 5.2)	64	1032	120000	9100	1280
IBM eServer 1350-xSeries 335 (2 way 3.06GHz Xeon w/Infiniband)	252	1032	180000		1542
Cray X-1 (800 MHz)	88	1029.6	202752	23936	1126.4
IBM Power 595 (5.0 GHz POWER6)	64	1028	183800	17000	1280
Self Made P4(256/2.2GHz+112/2.4GHz+32/2.53w/Genet)	400	1011	257912		1843
HP Compaq AlphaServer SC ES40/833 (833 MHz)	812	1007	252700	39954	1352.8
Linux NetworX/Quadrics(2.4 GHz Xeon w/Myrinet)	391	1007	208000	25000	1732
Galactic Computing (2.8Ghz Pentium 4 Xeon, w/InfiniBand 4x)	264	1003	153000	30850	1478.4
IMSc-Netweb-Summation Intel dual Xeon 2.4 GHz w/Dolphin 3D SCI	288	1002	183000		1382.4
IBM eServer Opteron e325 Cluster (dual 2.0 GHz AMD Opteron w/GigE)	432	987.1	215000		1728
IBM PowerLinux 7R4 (4.0 GHz POWER7+, RHEL 6.4, Intelligent Energy Optimization enabled, up to 4.431 GHz)	32	987.1	160000	9000	1134

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM Power 750 Express (4.0 GHz POWER7+, AIX, Intelligent Energy Optimization enabled, up to 4.431 GHz)	32	984.5	163200	8930	1134
NEC SX-6/128M16	128	982.0	204800	12800	1024
IBM Power 750 Express (4.0 GHz POWER7+, SLES11SP2, Intelligent Energy Optimization enabled, up to 4.431 GHz)	32	980.2	160000	7400	1134
IBM eServer pSeries 690 Turbo (1.7 GHz POWER4+)	256	976.0	280000		1740.8
Intel dual Xeon 2.4 GHz w/Dolphin 3D SCI	288	970.3	182000		1382
Linux NetworX/Quadrics(2.4 GHz Xeon w/Myrinet)	352	962.8	200000	33000	1690
Self-made Intel Pentium 2.2 GHz w/SCI3D	400	960.4	220800	32800	1760
Self-made Intel Dual Xeon 2.4 GHz w/Dolphin 3D SCI	288	957.1	184000	33050	1382.4
IBM eServer 1350-xSeries 335 (2 way 3.06GHz Xeon w/Infiniband)	256	947.7	110000		1566.7
Cray X-1 (800 MHz)	80	937.0	194560	21376	1024.0
SunFire X4200 & X4100 (Dual Core AMD Opteron(tm) 2.39 GHz Processor 280 w/Infiniband SDR 4x (10Gb))	256	934.5	157184		1196.6
SP Power3 375 MHz Nighthawk 2	1056	929.8	220000	62000	1584
NEC SX-6/120M15(2ns)	120	927.6	204000	19440	960
IBM eServer Opteron e325 Cluster (2 way, 2.0 GHz AMD Opteron w/GigE)	432	926.6	201600		1728
HITACHI SR8000-F1/100(375MHz)	100	917.2	115000	15000	1200
IBM XSeries Xeon 2.8GHz, NPACI-ROCKS, Myrinet	256	916.5	150000	25000	1433.6
IBM p690 cluster, Power 4 1.3 GHz	360	910	210000		1872
IBM Power 750 Express (3.5 GHz POWER7+, AIX, Intelligent Energy Optimization enabled, up to 3.955 GHz)	32	895.7	163200	8930	1012
IBM eServer xSeries Linux cluster (2.4 GHz Pentium IV Xeon w/ Gigabit Ethernet)	768	894.9	210000		3686.4
CRAY T3E-1200E (600 MHz)	1080	891.5	259200	26400	1296
Fujitsu VPP5000/100 (3.33nsec)	100	886.0	195600	18000	960
HITACHI SR8000/128(250MHz)	128	873.6	120000	16000	1024
IBM Power 750 Express (3.55 GHz POWER7, RHEL 6, Intelligent Energy Optimization enabled, up to 3.86 GHz)	32	870.0	150016	7680	989
IBM eServer xSeries Linux (2.4GHz P4 Xeon)	768	868.6	200000		3686
SGI Origin 3000 (R14000A 600 MHz)	1024	852.9	129024	31744	1229
HP XC1 Itanium 2 (1 GHz w/Quadrics)	256	851.0	232000	24650	1024
Grendels dual 2.4 GHz Intel Xeons w/Myrinet	252	840.5	175760	27768	1210
IBM eServer 1350-xSeries 335 (2 way Xeon 2.4 GHz w/Myrinet)	250	829.8	154000		1200
IBM eServer pSeries 690 (1.1 GHz Power4)	512	826.5	185000	60000	2253
Apple G5 dual 2.0 GHz IBM Power PC 970s, Infiniband 4X primary fabric, Cisco Gigabit Ethernet secondary fabric	256	821	120000		1024
CRAY T3E-900 (450 MHz)	1320	815.1	134400	26880	1188
Compaq AlphaServer SC ES45/1Ghz	512	809	215000	27000	1024
HITACHI SR8000-G1/64(450MHz)	64	790.7	110000	8504	921.6
Compaq AlphaServer SC ES45/1GHz	480	772	140000	22950	960
LANL Space Simulator(Intel P4 2.53 GHz+1Gb)	288	757.1	180000	44000	1457
HP Integrity Superdome (1.6GHz/24MB Dual Core Itanium 2)	128	745.5	240000	27040	819.2

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	256	736.6	285000	25000	1331
Legend Group DeepComp 1800 - P4 Xeon 2.4 GHz - Myrinet	256	735.8	114920	28000	1228.8
Self-Made MVS1000M EV67 (667 MHz Myrinet)	768	734.6	270000	30000	1024
Fujitsu VPP5000/80 (3.33nsec)	80	730.2	273600	15360	768.0
IBM eServer pSeries 655/651(1.1GHz Power 4)	256	726.3	300000	20000	1126
IBM SP 176 nodes (375 MHz)	704	723.4	187000	37500	1056
Self-made MVS-5000BM Cluster IBM PowerPC 970 (1.6 GHz w/Myrinet)	84	722.1	200000	33000	1075.2
Presto III Athlon MP 1900+(1.6Ghz Myrinet)	480	716.1	100000		1536
Cray X-1 (800 MHz)	60	706.3	168960	18432	768.0
Compaq AlphaServer SC ES45/1GHz	480	706.0	205000	31400	960
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	224	704.8	135000		1165
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	256	701.5	224000		1331
HITACHI SR8000-E1/80(300MHz)	80	691.3	120000	9408	768
IBM Cluster 1350 (208 proc 2.4GHz P4 Xeon)	208	682.6	170000		998.4
NCSA Titan Cluster(Itanium 800MHz w/Myrinet)	320	677.9	183000	32000	1024
CRAY X1 (800 MHz, 60 procs)	60	675.5	168960	17610	768.0
SGI Altix 3000 (1.5 GHz)	128	668.3	224000		768
LANL Space Simulator P4(2.53GHz)+1000Mb/sw	288	665.1	180000	65000	1457
Compaq AlphaServer SC ES45/1GHz	480	660.8	210000	47000	960
Self-made MVS-5000BM Cluster IBM JS20, IBM PowerPC 970 1.6 GHz w/Myrinet	152	655.5	185000	29000	972.8
NEC Magi Cluster (PIII 933 MHz w/Myrinet)	1012	654.8	217600	29000	944
Intel Pentium 4(dual 2.0 GHz w/Myrinet 2000)	240	654.7	159000		960
SGI Altix 3000 (Itanium 2, 1.5 GHz)	128	651.7	160000	160000	768
IBM eServer Opteron Cluster (2-way Opteron 2.0 GHz w/GigE)	240	651.4	166000	43200	960
IBM eServer pSeries 690 (1.5 GHz POWER4+)	192	651.4	220000		1152.0
Pentium 4 (256-2.2GHz,72-2.4GHz,32-2.8GHz)	360	644.	234000		1651
HP Superdome (1.5GHz Itanium 2, w/HyperPlex	128	642.9	235040	68000	768.0
IBM x335 Cluster dual Xeon 2.8 GHz + GIG-E	258	638.8	160000	65000	1433.6
IBM Flex System p270 (3.4 GHz POWER7+, RHEL 6.4, Intelligent Energy Optimization enabled, up to 3.787 GHz)	24	635	160000	7000	727
IBM eServer xSeries Cluster(2.8 GHz Pentium 4)	184	629.7	103000	20700	1030
SGI Origin 3000 (R14000 500 MHz)	768	623.2	163000	25000	768
RWC (933MHz 512-dual Pent III w/Myrinet2000)	1012	618.3	146000	23000	955.4
Dell 2650 Windows(Pentium 4 2.4 GHz w/Gnet)	256	618.0	166000	50000	1228
IBM BladeCenter Xeon Dual Processor 2.4 GHz GigE	280	613.9	200000		1344
IBM SP 140 nodes (222 MHz POWER3)	1120	613.02	170000	50000	994.6
HITACHI SR8000-F1/64(375MHz)	64	605.3	92000	10048	768
Intel Pentium 4(dual 2.0 GHz w/Myrinet 2000)	256	605.2	154000		1024
SGI Altix 3000 (Itanium 2, 1.3 GHz)	128	594.9	320000	320000	665.6
Linux Cluster UIUC-NCSA (1 GHz Pentium III)	1008	594.5	235000		1008

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
MEGWARE Computer GmbH (dual Intel Xeon 3.06GHz, FSB533, 8Gb/s Infiniband)	128	593.7	154856	16432	783.36
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	256	590.2	158000	158000	1331
ASCI Red Intel Pentium II Xeon core 333Mhz	2336	581.1	180864	31500	778
HITACHI SR8000-F1/60(375MHz)	60	577.5	89000	10000	720
Apple Xserve G5 (2GHz PowerPC 970 w/Myrinet)	88	575.4	114000		704
Cray X-1 (800 MHz)	49	572.5	150528	15232	627.2
Compaq Alpha 21264A(667MHz,dual w/Myrinet)	742	564.2	230000	37440	989.8
Fujitsu VPP5000/64 (3.33nsec)	64	563.0	235776	12288	614.4
IBM BladeCenter PS704 Express (2.46 GHz POWER7, RHEL 6,Intelligent Energy Optimization not enabled)	32	560.5	160000	7552	630.78
IBM BladeCenter PS704 Express (2.46 GHz POWER7, RHEL 6, Intelligent Energy Optimization not enabled)	32	559.6	160000	7552	630.78
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	192	558.2	245000	22000	998.4
IBM SP 120 nodes (222 MHz POWER3)	960	558.13	200000	53000	852.5
HITACHI SR8000-E1/64(300MHz)	64	556.5	110000	8000	614
IBM eServer pSeries 655 (16x8-way 1.7 GHz POWER4+)	128	556.5	156000	10000	870.4
IBM pSeries 690 Turbo(7x32 1.3GHz w/Gigenet)	224	555.3	226800		1165
SGI Origin 3000, 700 MHz	512	553.0	230000	230000	717
CRAY X1 (800 MHz, 49 procs)	49	550.5	150528	16128	627.2
Fujitsu M8000 (SPARC64 VII 2.52GHz, quad core)	64	548.2	156200	12000	645.12
Sun M8000 (SPARC64 VII 2.52GHz, quad core)	64	548.2	156200	12000	645.12
RWC SCore Cluster III Pentium III (933MHz)	960	547.9	140000	24000	955.4
IBM SP 475 nodes (332 MHz 604e)	1900	547.0	244000	58000	1262
IBM SP 32 nodes (375 MHz POWER3 High)	512	546.3	148000	33000	768.0
SGI Origin 2000 (250 MHz)	1536	543.2	203904	64512	768
IBM eServer xSeries Linux (2.4GHz P4 Xeon)	512	540.2	224200		2458
IBM SP 128 nodes (375 MHz POWER3 Thin)	512	538.4	163000		768
Bull Novascale 5160 (8x16 Itanium2 1.3 GHz w/Quadrics)	128	535.9	236544	36864	665.6
PARAM Padma C-DAC IBM p630(Quad P4-1.0GHz)w/PARAMNet-II	248	532.2	224000	43895	992
IBM x3850 X5 [Dual Chassis configuration with QPI (Quick Path Interconnect) (Intel Xeon X7560 @ 2.27 GHz, 64 cores (8 sockets * 8 cores)	64	526	168000		581
ASCI Red Intel Pentium II Xeon core -333Mhz	2336	522.5	121856	25300	778
IBM Power 740 Express (4.2 GHz POWER7+, AIX, Intelligent Energy Optimization enabled, up to 4.540 GHz)	16	517.1	117504	3500	581
IBM Power 730 Express (4.2 GHz POWER7+, AIX, Intelligent Energy Optimization enabled, up to 4.540 GHz)	16	514.3	117504	3500	581
CPlant/Ross(Alpha EV6 466 MHz w/Myrinet)	1000	512.43	142300		932
Compaq AlphaServer SC ES45/1Ghz	324	512	170000	20000	648
IBM PowerLinux 7R2 (4.2 GHz POWER7+, SLES11SP2, Intelligent Energy Optimization enabled, up to 4.540 GHz)	16	508.2	112128	4000	581
IBM Power 730 Express (4.2 GHz POWER7+, SLES11SP2, Intelligent Energy Optimization enabled, up to 4.540 GHz)	16	508.5	112128	4000	581
IBM Power 740 Express (4.2 GHz POWER7+, SLES11SP2, Intelligent Energy Optimization enabled, up to 4.540 GHz)	16	508.5	115383	4200	581

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Compaq ES40/EV67 AlphaServer SC	512	507.6	200000	30000	683
IBM Power 575 (4.7 GHz POWER6 RHEL 5.2)	32	500.0	105400	7000	601.6
IBM eServer pSeries 655 (8-way 1.5 GHz POWER4+)	128	498.5	224000	15000	768
BM Flex System p260 (4.1 GHz POWER7+, AIX, Intelligent Energy Optimization enabled, up to 4.340 GHz) 16	496	117504	3500		555
NEC SX-6/64M8	64	495.2	122880	6656	512
Fujitsu VPP5000/56 (3.33nsec)	56	492.4	228480	12768	538
IBM Flex System p260 (4.1 GHz POWER7+, SLES11SP2, Intelligent Energy Optimization enabled, up to 4.340 GHz)	16	485.4	112128	4300	555
IBM eServer pSeries 690 (1.1 GHz Power4)	256	485.2	158000		1126
Fujitsu VPP800/63 (4.0nsec)	63	482.5	234360	12852	504
AMD Athlon MP2000+ cluster(1.667GHz,w/Fenet)	240	480.7	116100	24570	800
IBM SP 28 nodes (375 MHz POWER3 High)	448	480.4	138000	31000	672.0
SKIF K-500 Pentium Xeon 2.8 GHz SCI 3D	128	475.3	123000	18304	716.8
PARRAM Padma (IBM p630 w/PARAMNet-II)	240	475.0	230400	72850	960
HP Superdome (750 MHz, HyperPlex)	256	470.93	340092	90072	768
IBM ASCI Option Blue Pacific (332 MHz)	1344	468.2	205000	65000	892
Sun Fire Supercluster (1050MHz 3x100)	300	468.1	230400	38400	630
IBM Power 575 (4.7 GHz POWER6)	32	467	110000	9000	602
SGI Origin 3000 (R14000A 600 MHz)	512	466.0	111104	19840	614.4
IBM eServer Blade Center JS20 (2-way PowerPC970 1.6Ghz w/GigE)	164	462	140000		1049.6
HITACHI SR8000/64(250MHz)	64	449.7	92000	9160	512
HP Superdome (750 MHz, 1000bT)	256	449.44	340092	110052	768
IBM Power 570 (4.2 GHz POWER6)	32	449.2	110000	18000	537.6
CRAY T3E (300 MHz)	1024	448.6	119808	19008	614
CRAY T3E-1200E (600 MHz)	540	447.8	181440	17280	648
IBM SP 96 nodes (222 MHz POWER3)	768	446.20	183000	45000	682.0
IBM xSeries(2.8 GHz Intel P4 w/Myrinet 2000)	126	443.7	125000		705.6
CRAY T3E-900 (450 MHz)	690	443.1	144000	18720	621
IBM Power 740 Express (3.55 GHz POWER7)	16	439.3	130400	400	494.6
IBM Power 740 Express (3.55 GHz POWER7, RHEL 6, Intelligent Energy Optimization enabled, up to 3.86 GHz)	16	435.8	112129	5200	494
IBM Power 730 Express (3.55 GHz POWER7)	16	435.4	112128	5376	494
IBM Power 570 (4.2 GHz POWER6 RHEL 5.2)	32	433.7	110000	7000	537.6
NEC SX-6/56M7	56	433.6	107520	5824	448
IBM Power 730 Express (3.55 GHz POWER7)	16	432.9	92000	4000	494.6
Cray X-1 (800 MHz)	36	422.1	129024	13056	460.8
Dell Cluster (2.4 GHz XEON w/Myrinet)	128	421.9	117200		614.4
Sun HPC 4500 Cluster/64 (400MHz/8MB L2)	896	420.44	144000	43200	716.8
Intel Itanium 2 (1.3 GHz Quad proc w/Myrinet 2000)	96	418.4	136000	18000	499.2
IBM eServer p5 595 (1.9GHz POWER5)	64	418.0	152000	8000	486.4
IBM eServer p5 595 (1.9GHz POWER5)	64	416.8	157000	12000	486.4
Intel dual Pentium Xeon (768-3.06 GHz & 252-3.2 GHz w/Myrinet)	1020	415.2	321600		631.1

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
CRAY T3E-900 (450 MHz)	640	413.7	138240	18432	576
SGI Origin 3000 (500 MHz)	512	405.60	230000	130560	512
CRAY X1 (800 MHz, 36 procs)	36	404.3	129024	12416	460.8
AMD Athlon 1900+ 1.6 GHz Myrinet-2000	240	403.6	142000	26000	768
Self-made Xenia / IBM Intellistation(Xeon 2.4 GHz) Myrinet	128	401.4	85000	14600	614.4
HITACHI SR8000-G1/32(450MHz)	32	395.6	85000	5320	460.8
IBM eServer xSeries Linux (2.4GHz P4 Xeon)	256	381.1	158600		1229
SGI Origin 2000 (250 MHz)	1024	379.6	164736	40500	512
SGI Altix 3000, 900 Mhz	128	378.9	110400	30000	461
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	128	378.2	200000	16000	665.6
IBM BladeCenter PS702 Express (3.00 GHz POWER7, RHEL 6, Intelligent Energy Optimization enabled, up to 3.30 GHz)	16	375.7	112128	6408	423
NEC SX-6/48M6	48	374.5	107520	4992	384
CP-PACS* (150 MHz PA-RISC based CPU)	2048	368.2	103680	30720	614
Intel Pentium III (572@1GHz, 452@1.266GHz)	1024	366.0	242000		1144
NEC SX-5/48M3 (4 nsec)	48	364.6	76800		384
IBM eServer pSeries 655/651(1.1GHz Power 4)	128	364.5	210000	13000	563
IBM xSeries 2.8 Ghz x335 Pentium IV Linux cluster	128	361.6	112000		716.8
Fujitsu VPP5000/38 (3.33nsec)	38	351.1	196080	9120	364.8
IBM SP (200 MHz Power 3 nodes)	768	350.4	113000	30000	614
Intel Pentium4 1.7GHz(1) / 2.0GHz(98) / 2.4GHz(44) / 2.53GHz(35) / 2.8GHz(4) Giganet	182	349.3	144800		806.1
Compaq AlphaServer SC ES40/833	256	344.1	142000	17000	427
PowerEdge 2650(P-4,2GHz+120 P-4,2.2GHz w/Gnet)	180	343.4	100000		768
CRAY T3E (300 MHz)	784	342.8	104832	17280	470
HP Superdome (1.5GHz Itanium 2, 6.0MB L3 Cache)	64	341.7	154080	15040	384.0
SGI Altix 3000 (Itanium 2, 1.5 GHz)	64	338.0	160000	160000	384
HP Superdome (1.5GHz Itanium2, 6MB L3 Cache)	64	335.45	150080	15200	384.0
IBM Power 730 Express(3.7 GHz POWER7)	12	335.2	108000	440	376.3
Self Made P4(95/2GHz+341/2.4GHz+32/2.53 w/Gnet)	168	334.9	138990	40000	739
IBM Power 730 Express (3.72 GHz POWER7, RHEL 6, Intelligent Energy Optimization enabled, up to 3.92 GHz)	12	333.1	112128	5504	376.32
Compaq AlphaServer SC ES40/EV67 833 MHz	256	332.2	192000	20000	426.5
Athlon MP 1.2Ghz, w/Myrinet 2000	252	331.7	90720		614.4
Cray X-1 (800 MHz)	28	329.8	114688	12160	358.4
PowerEdge HPC Cluster (2.4 GHz Xeon w/Gnet)	198	327.9	100000		950
Compaq AlphaServerSC ES40(833 MHz Quadrics)	300	326.4	110000	38000	499.8
Xenia/IBM Intellistation(Xeon 2.4 GHz w/Myrinet)	128	323.4	86000	14600	614.4
Helix(Cardiff 108@2.2 GHz, 36@2.4 GHz w/Dophin)	144	322.5	105000	17000	648
CRAY T3E-900 (450 MHz)	512	321.1	122880	15360	461
Fujitsu VPP700/160E (6.5nsec)	160	319.4	168000	24000	384
CRAY X1 (800 MHz, 28 procs)	28	318.1	114688	11302	358.4
IBM xSeries Xeon Dual Processor 2.4 GHz	168	317.8	137000		806.4

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
SGI Origin 3000 400 MHz, 512 CPU	512	315.5	130560	108800	409.6
HITACHI SR8000-F1/32(375MHz)	32	313.3	65000	6000	384
IBM SP 256 nodes (332 MHz 604e)	1024	311.9	180000	40000	680
NEC SX-6/40M5	40	311.7	102400	4480	320
CPlant/Siberia(Alpha EV6 500 MHz w/Myrinet)	552	309.2	105700		552
Dell PowerEdge HPC(P4 2.4 GHz Xeon w/Myrinet)	128	308.3	115000		614.4
IBM SP 64 nodes (222 MHz POWER3)	512	307.63	148000	35000	454.7
IBM pSeries 690 Turbo(4x32 1.3GHz w/Gigenet)	128	306.4	112000		665.8
SGI Origin 3000 (500 MHz, 384 CPU)	384	306.30	384000	96768	967.7
SGI Origin 2800 (400MHz)	512	300.23	130560	21216	409.6
SGI Origin 2000 (400 MHz, 512 CPU)	512	300.20	130560	130560	409.6
SGI Altix 3000 (Itanium 2, 1.3 GHz)	64	297.2	160000	160000	332.8
Fujitsu VPP5000/32 (3.33nsec)	32	296.1	170880	7680	307
IBM SP 256 nodes (200 MHz POWER3)	512	287.84	140000	30000	410
COMPAS-ECCO (Pentium III, 1GHZ w/Myrinet)	480	285.9	150000	17000	480
Compaq AlphaServer SC ES45/1GHz (ev68)	176	285.3	124000	14000	352
Intel Paragon XP/S MP (50 MHz OS=SUNMOS)	6768	281.1	128600	25700	338
Dell Precision 530(Pentium 4-1.7 GHz, GigE)	208	280.4	96000		707
NEC SX-7/32 (1.81ns)	32	280.3	72000	2064	282.5
SGI Origin 3000, 700 MHz	256	279.9	163000	163000	358
HP rx26000 Itanium2 1.3GHz Cluster w/InfiniBand	64	278.7	98304	9216	332.8
IBM SP 16 nodes (375 MHz POWER3 High)	256	278.3	107000	21200	384.0
Dell PowerEdge HPC Cluster(2.4 GHz Xeon w/genet)	128	277.8	115000	30000	614
IBM Power 570 (5.0 GHz POWER6)	16	277.7	104000	5600	320.6
IBM eServer xSeries Linux (2.4GHz P4 Xeon)	128	274.0	112000		614.4
Sun HPC4500 Cluster/60 (336MHz/4MB L2)	720	272.1	192000		483.8
Compaq Alphaserver SC512(500Mhz w/Quadrics)	512	271.4	140000		512
Fujitsu VPP700/128E (6.5nsec)	128	268.9	166400	23040	307
Fujitsu SPARC Enterprise M9000 (2.4 GHz)	32	268.6	162085	6500	307.2
Sun SPARC Enterprise M9000 (2.4 GHz)	32	268.6	162085	6500	307.2
Compaq ES40/EV67 AlphaServer SC	256	263.6	106000	20000	342
hp server rp8400 (750 MHz, HyperPlex)	128	261.09	234144	50004	384
IBM eServer pSeries 690 (1.1 GHz Power4)	128	259.5	112000	21000	563.2
IBM SP 64 nodes (375 MHz POWER3 Thin)	256	257.82	148000	24000	384
Intel Paragon XP/S MP (50 MHz OS=SUNMOS)	6144	256.2	122500	24300	307
HITACHI SR8000/36(250MHz)	36	255.9	69000	5968	288
Fujitsu SPARC Enterprise M9000 (2.28 GHz)	32	255.3	158045	6500	291.8
Sun SPARC Enterprise M9000 (2.28 GHz)	32	255.3	158045	6500	291.8
NEC SX-6	32	253.6	76800	3328	256
NEC SX-6/32M4	32	251.2	92160	3584	256
hp server rp8400 (750 MHz, 1000bT)	128	251.11	234144	70092	384
HP Superdome (750 MHz, HyperPlex)	128	248.90	220104	36072	384
IBM eServer pSeries 655 (8-way 1.5 GHz POWER4+)	64	248.7	160000	11000	384

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
NEC SX-5/32M2 (4 nsec)	32	247.0	55296		256
HP Superdome (750 MHz, 1000bT)	128	245.11	220968	43092	384
SGI Origin 3000 (R14000A 600 MHz)	256	245.1	120000	120000	307.2
SGI Origin 2000 300 MHz, 512 CPU	512	241.40	147456	33984	307.2
IBM Power 570 (4.7GHz, POWER6)	16	239.4	92000	4400	301
IBM Power 570 (4.7GHz POWER6)	16	239.4	92000	4400	300.8
LosLobos Supercluster(PIII 733MHz w/Myrinet)	500	237.0	150000	20000	366.5
IBM Power 570 (4.7 GHz POWER6)	16	235.1	90000	7230	300.8
CRAY T3E (300 MHz)	540	234.9	86400	14400	324
HELIX (AMD 1.76GHz w/gnet)	132	234.8	82080	25000	466
HITACHI SR2201/1024(150MHz)	1024	232.3	155520	34560	307
Numerical Wind Tunnel* (9.5 ns)	167	229.7	66132	18018	281
HITACHI SR8000/32(250MHz)	32	229.5	65000	5632	256
IBM Power 570 (4.7 GHz POWER6 RHEL 5.1)	16	229.4	110000	8400	300.8
Intel Paragon XP/S MP (50 MHz OS=SUNMOS)	5376	223.6	114500	22900	269
CRAY T3E (300 MHz)	512	222.3	84480	12480	307
CLiC (Pentium III 800 MHZ)	529	221.6	176640	28272	423.2
Korean Inst S&T(Pentium 4 1.7GHz w/Myrinet)	128	221.6	115000	18000	435.2
SGI Altix 3000, 1 Ghz	64	219.4	167039	167039	256
IBM eServer p5 595 (1.9GHz POWER5)	32	217.1	130000	9000	243.2
Fujitsu VPP700/116(7nsec)	116	213.0	111360	18560	255
Titech Grid Cluster, Pentium III-S 1.4Ghz	256	212.7	115000		358.4
CRAY T3E-1200E (600 MHz)	256	211.8	125952	11520	307
Compaq SC232 (667 MHz)	232	211.0	120000		309.5
IBM SP 128 nodes (332 MHz 604e)	512	210.2	100000	20872	340
SGI Origin 3000 (500 MHz)	256	210.20	163200	163000	256
HITACHI SR8000-F1/20(375MHz)	20	206.15	68000	4440	240
Intel EPG (dual 3.06GHz Xeon w/Myrinet)	64	202.7	100000		391.7
Fujitsu VPP500/153(10nsec)	153	200.6	62730	17000	245
HITACHI SR8000-G1/16(450MHz)	16	199.1	62000	3440	230.4
Self Made(91-P4 2GHz + 35-P4 2.4GHz w/Genet)	126	198.7	85000	30000	532.0
IBM ASCI Option Blue Pacific (332 MHz)	672	198.6	95000	37000	446
SGI Origin 3000 Cluster2x128(R14000A 600 MHz)	256	198.5	160000	160000	307.2
SGI Altix 3000, 900 MHz	64	197.4	119039	119039	230
Self-Made Intel Pentium 4 Xeon(1.7GHz w/GigE)	208	197.2	90000		707
HPTi ACL-276/667 (Alpha 667 MHz w/Myrinet)	270	196.34	80000		360
SGI Origin 2000 (250 MHz)	512	195.6	110592	23040	256
Numerical Wind Tunnel* (9.5 ns)	140	195.0	60480	15730	236
HP Integrity rx8640 (1.6GHz/24MB Dual-Core Itanium 2)	32	192.4	116000	7520	204.8
Intel Paragon XP/S MP (50 MHz OS=SUNMOS)	4608	191.5	106000	21000	230
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	64	191.4	148000	11000	332.8
NEC SX-6/24M3	24	188.7	69120	2688	192
Cray X-1 (800 MHz)	16	188.5	81920	8064	204.8

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM eServer p5 590 (1.65GHz POWER5)	32	187.8	113000	5800	211.2
IBM eServer pSeries 655/651(1.1GHz Power 4)	64	184.7	150000	9000	282
Netfinity Xseries(X330) PIII 1GHz	320	184.4	120000	1500	320
IBM x330 Cluster PIII 1GHz w/100Mb enet	420	182.4	192000	192000	420
CRAY X1 (800 MHz, 16 procs)	16	182.3	81920	8242	204.8
NEC TX7/i9510 Itanium2 1.6GHz	32	181.92	200848	7824	204.8
Numerical Wind Tunnel* (9.5 ns)	128	179.2	56832	14800	216
Compaq AlphaServerSC ES40/EV68 833MHz	160	178.0	71000	20000	266.5
Sun Fire 15K (1050MHz/8MB E$)	106	177.2	206116	18000	222.6
NEC TX7/i9510 Itanium2 1.5GHz	32	172.30	161936	7440	192
SGI Altix 3000 (Itanium 2, 1.5 GHz)	32	171.9	16000	16000	192.0
SGI Itanium 2, 800 MHz	64	171.8	115199	115199	204.8
HP 9000 Superdome (1000MHz PA-8800)	64	171.8	120800	10000	256
IBM QS22 blade (2 PowerXCell 8i processors)	18	170.7	48895		217.6
Fujitsu VPP500/128(10nsec)	128	170.2	56832	14804	205
Intel Pentium III (1 GHz w/100 Mb enet)	512	169.4	16000		512
Sun Fire 15K (1050MHz/8MB E$)	104	168.5	96116	17000	218.4
IBM S80s (450 MHz, SP switch)	360	167.87	113000	31000	324
Compaq AlphaServer SC ES40/EV67 (667MHz)	184	167.5	99900	22500	245.5
Self Made(6-P4 1.7GHz + 99-P4 2GHz w/Genet)	105	167.2	77900	27000	416.4
Origin 3000 400 MHz Cluster(2x128)	256	167.1	204800	163000	204.8
IBM eServer pSeries 690 (1.1 GHz Power4)	64	163.8	148000		332.8
SGI Origin 3000 400 MHz, 256 CPU	256	163.5	163200	81920	204.8
IBM eServer pSeries 690(2x32w/Genet 1.3GHz)	64	161.9	80000		281.6
CRAY T3E-900 (450 MHz)	256	161.6	84480	10080	230
Intel P 4 cluster(92-2.0GHz+6-1.7GHz w/Genet)	98	160.4	75500	24000	388
HITACHI SR8000-F1/16(375MHz)	16	159.5	46000	3800	192
Pentium 4 (2 GHz w/Giganet)	91	157.8	73500	26000	364
IBM S80s (450 MHz, SP switch)	336	157.75	109000	29000	302
Sun Fire 15K (1050 MHz/8MB E$)	96	157.6	96116	16000	201.6
IBM SP 32 nodes (222 MHz POWER3)	256	157.46	107000	25000	227.3
Compaq AS SC256 (500 MHz EV6 Quadrics sw)	256	154.4	120000	26000	256
SGI Origin 2000 400 MHz, 256 CPU	256	152.20	163200	163200	204.8
SGI Altix 3000 (Itanium 2, 1.3 GHz)	32	151.8	160000	160000	166.4
IBM SP/472 (120 MHz)	460	151.8	61000	22600	221
Intel Paragon XP/S MP (50 MHz OS=SUNMOS)	3648	151.7	95000	18100	182
SGI Origin 3000 (400 MHz) (2x128 cpu)	256	151.20	112640	112640	204.8
HITACHI SR8000-G1/12(450MHz)	12	150.11	54000	3000	172.8
IBM SP 128 nodes (200 MHz POWER3)	256	149.36	100000	18500	205
Sun Blade 1000 750MHz Cluster w/Myrinet2000	196	149.2	70560	70560	294
Compaq ES40/EV68 AlphaServer SC (833 MHz)	128	149.1	70000		213.2
Fujitsu VPP5000/16 (3.33nsec)	16	149.1	120768	4416	154
Compaq AlphaServerSC ES40(833 MHz Quadrics)	160	148.	71000	2000	266.5

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
SGI Origin 2000 (250 MHz)	384	147.1	96768	17280	192
IBM S80s (450 MHz, SP switch)	312	146.26	104800	28000	281
Sun Fire 15K (1050MHz/8MB E$)	88	144.6	96116	15000	184.8
HITACHI SR8000/20(250MHz)	20	144.5	48000	4000	160
Intel Paragon XPS-140 (50 MHz OS=SUNMOS)	3680	143.4	55700	20500	184
IBM eServer pSeries 690 Turbo(1.7GHz POWER4+)	32	143.3	151000	5000	217.6
HP AlphaServer GS1280 7/1300 (1.3 GHz)	64	142.8	122500		166.4
NEC SX-6/16M2 (1.77ns)	16	142.8	51200	2048	144
Cray X-1 (800 MHz)	12	142.4	73728	7040	153.6
SGI Origin 2000 (195 MHz)	480	141.2	108864	21312	187
HITACHI SR8000-E1/16(300MHz)	16	140.8	62000	3200	154
SGI 1100 Cluster (Dual Pentium III, 1 GHz)	324	140.5	133000		324
IBM SP 8 nodes (375 MHz POWER3 High)	128	138.8	76000	16000	192.0
IBM Power 550 (5.0 GHz POWER6+)	8	137.6	64200	1900	160.0
CRAY X1 (800 MHz, 12 procs)	12	137.6	73728	6294	153.6
IBM S80s (450 MHz, SP switch)	288	137.17	100800	26000	259
IBM Power 550 (5.0 GHz POWER6+ SLES 11)	8	137.1	85000	3500	160.0
IBM eServer pSeries 690 Turbo(1.1 GHz)	64	137.1	80000	13500	281.6
Compaq ES40/EV6 AlphaServer SC	256	135.7	120000		256
Fujitsu VPP500/100(10nsec)	100	135.3	51000	12816	160
HP Superdome (750 MHz)	64	133.82	138888		192
IBM SP 32 nodes (375 MHz POWER3 Thin)	128	132.75	107000	15400	192
hp server rp8400 (750 MHz, HyperPlex)	64	132.71	137808	21384	192
hp server rp8400 (750 MHz, 1000bT)	64	132.69	165456	29268	192
Sun Fire 15K (1050MHz/8MB E$)	80	132.6	96116	14000	168.0
Intel Itanium 2 1.3 GHz	32	132.5	73400		166.4
Dell PowerEdge HPC(Dual Pentium III, 1 GHz)	400	131.0	130000	65000	400
Fujitsu VPP500/96 (10nsec)	96	129.5	49728	12430	154
Fujitsu VPP700/64 (7nsec)	64	129.5	115200	12800	141
Paragon XP/S MP(1024 Nodes, OS=SUNMOS S1.6)	3072	127.1	86000	17800	154
NEC SX-8/8 (2 GHz)	8	126.2	30720		128
NEC SX-5/16 (4 nsec)	16	125.8	55296		128
NEC SX-6/16M2 (2 nsec)	16	125.70	51200	2240	128
SGI Origin 3000 600 MHz, 128 CPU	128	125.5	81920	81920	154
IBM eServer pSeries 655 (8-way 1.5 GHz POWER4+)	32	125.2	112000	6000	192
IBM S80s (450 MHz, SP switch)	264	124.66	96800	25000	238
Sun HPC 10000 Cluster/4 (336 MHz, 4MB L2)	256	123.9	80640	26880	172
HITACHI SR8000-G1/10(450MHz)	10	123.4	49440	2648	144.0
Origin 3000 400 MHz Cluster(64+128)	192	122.3	96000	111000	153.6
NEC SX-4/64M2 (8.0 ns)	64	122.2	30080	4352	128
Compaq AlphaServer SC40 EV/67 667 MHz	112	121.3	107520		149
Dell PowerEdge Cluster W2K(Dual PIII,1GHz/Gnet)	252	120.7	155000	50000	252
IBM Power 570 (4.7GHz, POWER6)	8	120.6	58000	3400	150

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM Power 570 (4.7GHz POWER6)	8	120.6	58000	3400	150.4
Sun Fire 15K (1050MHz/8MB E$)	72	119.8	96116	12500	151.2
IBM Power 570 (4.7 GHz POWER6)	8	118.4	79680	4000	150.4
Linux cluster PIII(1.0 GHz, w/100 Mb/s enet)	256	118.1	157000	157000	256
Fujitsu PRIMEPOWER2000(675MHz)	128	118.0	116480	43000	259.2
IBM Power 570 (4.7 GHz POWER6 RHEL 5.1)	8	116.4	83000	4400	150.4
CRAY T3E-900 (450 MHz)	192	116.0	51840	8448	171
HITACHI SR8000/16(250MHz)	16	115.9	42928	3584	128
Fujitsu PRIMERGY CL460J (Pentium4 1.7GHz)	64	115.7	40000	9000	217.6
Cray T3E-1350 (675 MHz)	128	113.9	89088	7488	172.8
IBM S80s (450 MHz, SP switch)	240	113.31	92000	24000	216
IBM BladeCenter JS43 Express (4.2 GHz POWER6+ SLES 11)	8	113.1	65000	3300	134.4
CRAY T3E (300 MHz)	256	112.8	59904	8832	154
SGI Altix 3000, 1 Ghz	32	111.9	100000	100000	128
IBM SP (160 MHz, P2SC)	256	111.64	52000	13100	163
IBM System p5 575 (1.9GHz POWER5+)	16	111.4	92400	1340	121.6
SGI 1100 Cluster (Pentium III 1GHz)	266	110.4	119000		266
Fujitsu VPP700/56 (7nsec)	56	110.3	109200	10752	123
Sun UltraSPARC II 450MHz 40 E420R 4proc/node	160	110.0	136080	136080	144
Fujitsu VPP500/80 (10nsec)	80	109.8	46400	11030	128
SGI Origin 2000 300 MHz Cluster(2x128)	256	109.5	81920	81920	153.6
Dell PowerEdge HPC (Dual Pentium III, 1 GHz)	320	109.0	120000	60000	320
IBM SP 64 nodes (332 MHz 604e)	256	108.1	81460	14180	170
SGI Origin 3000 (500 MHz)	128	106.9	81920	81920	128
Sun Fire 15K (1050MHz/8MB E$)	64	106.9	96116	12000	134.4
Sun Fire E6900 (UltraSPARC IV 1.35 Ghz w/custom)	48	106.6	141565	8900	129.6
CRAY T3E-1200E(600 MHz)	128	106.0	89088	7488	154
IBM S80s (450 MHz, SP switch)	216	104.92	87000	22000	194
IBM System p5 560Q (1.8 GHz POWER5+)	16	104.7	87400	4080	115.2
IBM Power 550 (4.2GHz, POWER6)	8	104.6	76000	1700	135
IBM Power 550 (4.2GHz POWER6)	8	104.6	76000	1700	134.4
IBM Power 550 (4.2 GHz POWER6 RHEL 5.1)	8	104.2	85000	6100	134.4
IBM System p5 560Q (1.8GHz POWER5)	16	104.2	92300	1400	115.2
Sun Fire 15K (900MHz/8MB L2$, perflib)	72	103.7	96116	10700	129.6
IBM eServer p5 570 (1900 MHz POWER5)	16	103.1	72000	4000	121.60
IBM SP (375 MHz POWER3)	90	102.8	90000		135.0
Fujitsu PRIMEPOWER2000(563MHz)	128	102.0	116480	44000	216
NEC TX7/i9510 (Itanium2,1GHz)	32	101.77	128016	21840	128
SGI Origin 2000 (250 MHz)	256	101.4	86400	13248	128
HITACHI SR8000-G1/8(450MHz)	8	101.3	44000	2432	115.2
Compaq AlphaServer SC40 EV/67 667 MHz	96	101.2	96000	10000	128
SGI Origin 3000 500 MHz, 128 CPU	128	101.0	115000		128
Pentium 4 (2 GHz, Giganet + F-enet)	56	100.7	55000	16000	224

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Cray T3D 1024 (150 MHz)	1024	100.5	81920	10224	152
Sun Ultra HPC10000 Cluster/4(250 MHz,4MB L2)	256	100.4	80640	22528	128
IBM SP (375 MHz POWER3)	88	99.7	88000		132.0
SGI Origin 2000 250/300 MHz Cluster (2x64x250+2x64x300)	256	98.87	81920	81920	140.8
Sun Fire 6900 (UltraSPARC IV, 1.2 GHz)	48	98.26	96116	8300	115.2
IBM Cell BE (3.2 GHz)*****	9	98.05	4096	1536	14.6 (64 bit) 204.8 (32 bit)
SGI Altix 3000, 900 MHz	32	97.67	82079	82079	115
HP Integrity rx7640 (1.6GHz/18MB Dual-Core Itanium 2)	16	96.85	76520	4320	102.4
Kepler (192 PIII@650 MHz + 4 PIII@733 MHz)	196	96.25	109760	12320	127.7
IBM SP (375 MHz POWER3)	84	95.5	88000		126.0
IBM eServer pSeries 690 Turbo(1.3 GHz Power 4)	32	95.26	108000	7000	166.4
Cray X-1 (800 MHz)	8	95.2	61440	5632	102.4
Fujitsu VPP700/46 (7nsec)	46	94.3	100280	8280	101
SGI Origin 300 (500 MHz, w/Myrinet)	128	94.15	81920	81920	128
HP 9000 rp8420-32 (1000MHz PA-8800)	32	94.1	58960	5200	128
ClearSpeed CSX600 Advance accelerator boards (dual ClearSpeed boards each 250 MHz) (frontend HP ProLiant DL380 G5, dual node Intel Xeon 5100 dual core, 3 GHz)	6	93.3	45000		240
SGI Origin 2000 250 MHz Cluster(2x128)	256	92.99	81920	81920	128
NEC SX-4/48M2 (8.0 ns)	48	92.63	30080	2688	96
Sun Ultra HPC10000 Cluster/4(250 MHz,4MB L2)	244	92.6	80640	21504	122
Sun Fire 15K (900MHz/8MB L2$, perflib)	64	92.58	96116	10000	115.2
CRAY X1 (800 MHz, 8 procs)	8	92.4	61440	4996	102.4
IBM eServer pSeries 655/651(1.1GHz Power 4)	32	92.24	106000	6000	141
IBM eServer pSeries 690 Turbo (1300 MHz)	32	91.32	72000	3800	166.4
CRAY T3E-1200E	112	90.4	58368	6432	134
Fujitsu VPP500/64 (10nsec)	64	89.3	41472	9820	102
Sun Fire E6900 (UltraSPARC IV 1.35 Ghz w/custom)	40	89.03	119565	7300	108.0
HP Integrity rx8620 (1.5GHz Itanium2, 6MB L3 Cache)	16	88.8	58600	4200	96.0
IBM SP2-T2 (66 MHz)	512	88.4	73500	20150	136
Sun Ultra HPC10000 Cluster/4(250 MHz,4MB L2)	224	87.94	80640	19200	112
IBM System p5 560Q (1.5GHz POWER5+)	16	87.77	92400	1320	96.0
Compaq Alphaserver GS320 (731Mhz 4MB L2)	128	87.51	110000	110000	170.8
IBM eServer p5 575 (1.5 GHz POWER5)	16	87.34	71050	1320	96.0
Presto III Athlon Cluster(1.33GHz, Myrinet)	78	87.25	75160	25000	207.5
Hewlett-Packard SuperDome 552 MHz	64	86.45	41000	3960	141.3
SGI Origin 3000 400 MHz, 128 CPU	128	85.44	65536	65536	102.4
IBM Cell BE (2.1 GHz)*****	9	84.52	3712	1792	9.6 (64 bit) 134.4 (32 bit)
Bull NovaScale 5160 Intel Itanium 2 (1.5 GHz)	16	83.25	85760	4736	96
CRAY T3E (300 MHz)	192	83.07	51840	7680	115
Sun Fire 6900 (UltraSPARC IV, 1.2 GHz)	40	82.12	96116	6500	96.0
SGI Origin 3000 400 MHz, 256 CPU	256	81.90	81920	81920	102.5
SGI Origin 2000 400 MHz, 128 CPU	128	81.76	65536	65536	102.4

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
H-P e-vectra Pentium III 733 MHz	225	81.60	80370	23265	165.9
Origin 3000 400 MHz Cluster(2x64)	128	81.56	153600	81920	102.4
Sun Fire 15K (900MHz/8MB L2$, perflib)	56	81.27	96116	8400	100.8
IBM S80s (450 MHz, SP switch)	168	80.87	77000	20000	151
IBM SP 16 nodes (222 MHz POWER3)	128	80.83	76000	15000	113.7
Sun Fire 15K (1050MHz/8MB E$)	48	80.75	96116	8500	100.8
HITACHI SR8000-F1/8(375MHz)	8	80.25	30352	2504	96
Compaq AlphaserverSC 833mhz	64	80.00	60000	10000	106.6
Sony PlayStation 3 (3.2 GHz)*****	7	79.9	2000	900	11 (64 bit) 154 (32 bit)
CRAY T3E-900 (450 MHz)	128	79.59	42240	6432	115
Sun HPC 10000 Cluster/2 (400MHz/4MB L2)	128	79.36	57120	10752	102
Hitachi S-3000 cluster/412 (3x4) (2 ns)	12	78.2	31120	4880	96
Presto III Athlon Cluster(1.33GHz, F-enet)	78	77.4	75160	25000	207.5
IBM SP 64 nodes (200 MHz POWER3)	128	76.77	89000	11500	102
Fujitsu-Siemens hpcLine(Pentium III,850 MHz)	192	76.1	66720	12960	163.2
Sun Ultra HPC10000 Cluster/3(250 MHz,4MB L2)	192	75.65	65520	19200	96
Sun Ultra HPC10000 Cluster/4(250 MHz,4MB L2)	192	75.58	80640	16320	96
Fujitsu VPP5000/8 (3.33nsec)	8	74.89	85440	2688	76.8
Intel Paragon XPS-140 (50 MHz)	1872	72.9	55000	17500	94
SGI Origin 2000 300 MHz Cluster(128+32)	160	72.57	61440	61440	96
NEC SX-6/8 (1.77ns)	8	71.67	30720	800	72
Sun Fire E6900 (UltraSPARC IV 1.35 Ghz w/custom)	32	71.60	119565	5900	86.4
HP AlphaServer GS1280 7/1300 (1.3 GHz)	32	71.13	65536		83.2
IBM S80s (450 MHz, SP switch)	144	70.94	72000	18000	130
IBM SP 4 nodes (375 MHz POWER3 High)	64	70.65	54000	11000	96.0
Sun Fire 15K (900MHz/8MB L2$, perflib)	48	69.88	96116	7500	86.4
IBM SP 16 nodes (375 MHz POWER3 Thin)	64	67.78	76000	10400	96
Sun Fire 15K (1050MHz/8MB E$)	40	67.52	96116	7500	84.0
Fujitsu VPP700/32 (7nsec)	32	67.3	83200	5760	70
Sun HPC 10000 Cluster/2 (336 MHz, 4MB L2)	128	66.93	57120	10080	86
NEC SX-4/32 (8.0 ns) ***	32	66.53	15360	1792	64
IBM System p5 575 (2.2GHz POWER5+)	8	66.44	57200	860	70.4
Sun Fire 6900 (UltraSPARC IV, 1.2 GHz)	32	65.94	96116	5400	76.8
IBM eServer pSeries 670 (1.5GHz POWER4+)	16	65.06	80000	1200	96.0
IBM Power 520 (4.7 GHz POWER6+)	4	65.01	47600	840	75.2
RWC SCore Cluster II(Dual PIII 800MHz+Myrinet)	132	64.7	58000	8000	105.6
IBM Power 520 (4.7 GHz POWER6+ SLES 11)	4	64.42	60000	1900	75.2
Origin 3000 600 MHz, 64 CPU	64	64.15	81920	81920	76.8
IBM eServer pSeries 655 (8-way 1.5 GHz POWER4+)	16	64.07	80000	4000	96
Paragon XP/S MP(512 Nodes, OS=SUNMOS S1.6)	1516	64.0	61000	12200	77
Compaq Alphaserver GS320 (731Mhz 4MB L2)	64	63.81	60000	9000	85.4
Compaq ES40/EV67 AlphaServer SC	64	63.8	60000	9000	85.4
NEC SX-8/4 (2 GHz)	4	63.30	30720		64
NEC SX-6/8 (2 nsec)	8	63.21	30720	800	64

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
hp AlphaServer GS1280 7/1150(1.15 GHz)	32	62.89	65536		73.6
HP Kayak Intel Cluster (NT 550 MHz PIII)	256	62.59	122500	20500	141
SGI Origin 2000 (300 Mhz)	128	62.25	60032	9000	77
Cray T932 (2.2 ns) ***	32	61.8	16384	1280	58
NEC SX-4/32 (8.0 ns)	32	61.77	20480	1688	64
IBM Power 570 (4.7GHz, POWER6)	4	61.6	39200	660	75
IBM Power 570 (4.7GHz POWER6)	4	61.56	39200	660	75.2
NEC SX-4/32M2 (8.0 ns)	32	61.32	20480	2432	64
Alphleet (Alpha cluster/Myranet, 500 MHz)	140	61.3	56000	22000	140
IBM Power 570 (4.7 GHz POWER6 RHEL 5.1)	4	60.37	59000	3500	75.2
IBM Power 570 (4.7 GHz POWER6)	4	60.08	55000	3000	75.2
Thinking Machines CM-5	1024	59.7	52224	24064	131
Hitachi S-3000 cluster/309 (3x3) (2 ns)	9	59.0	26940	3180	72
IBM S80s (450 MHz, SP switch)	120	58.97	65000	17000	108
Sun Fire 12K (1050MHz/8MB E$)	36	58.92	66166	6500	75.6
HITACHI SR2201/256(150MHz)	256	58.68	77760	13440	78
Sun Fire 15K (900MHz/8MB L2$, perflib)	40	58.41	96116	6500	72.0
HITACHI SR8000/8(250MHz)	8	58.3	30352	2304	64
Fujitsu VPP700/26E (6.5nsec)	26	58.0	74880	5200	62
IBM SP2 (160 MHz)	128	57.24	39000	9180	82
IBM BladeCenter JS23 Express (4.2 GHz POWER6+ SLES 11)	4	57.14	58000	2000	67.2
Cray T3E-1350 (675 MHz)	64	57.0	62976	5040	86.4
Sun Ultra HPC10000 Cluster/3(250 MHz,4MB L2)	144	56.97	65520	14400	72
IBM eServer p5 575 (1.9GHz POWER5)	8	56.78	61000	2800	60.8
CRAY T3E (300 MHz)	128	55.72	42240	5952	76.8
IBM eServer p5 575 (1.9GHz POWER5)	8	56.67	57200	796	60.8
Sun HPC 450 Cluster/40(300MHz/2MB L2 cache)	160	55.44	89600	22400	96.0
SGI2400(Origin 2000)Enet-Cluster(6x32 250MHz)	192	54.68	99840	99840	96
IBM SP 32 nodes (332 MHz 604e)	128	54.27	57600	9376	85
IBM Blade Server: BladeCenter T-HS20 w/2.8 GHz Xeon and GigE	16	54.16	38000	7600	89.6
Hitachi S-3000 cluster/408 (2x4) (2 ns)	8	54.1	31200	3760	64
IBM eServer Cluster 1350-xSeries 335 w/2.8 GHz Xeon and GigE	16	54.05	38000	7600	89.6
Sun Fire E6900 (UltraSPARC IV 1.35 Ghz w/custom)	24	53.81	101658	4500	64.8
IBM eServer p5 570 (1900 MHz POWER5)	8	53.80	53600	10000	60.8
IBM Power 520 (4.2GHz, POWER6)	4	53.6	47400	800	67
IBM Power 520 (4.2GHz POWER6)	4	53.59	47400	800	67.2
SGI Origin 3000 (500 MHz)	64	53.16	81920	81920	64
CRAY T3E-1200E (600 MHz)	64	53.07	62976	4992	76.8
Presto II PC cluster(PIII 824MHz w/fast enet)	132	52.83	68520	68520	108.8
IBM S80s (450 MHz, SP switch)	96	52.65	58000	13000	86.4
Sun Fire 12K (1050MHz/8MB E$)	32	52.58	66166	6000	67.2
Sun Fire 12K (900MHz/8MB L2$, perflib)	36	52.05	48108	5500	64.8

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM Power 520 (4.2 GHz POWER6 SLES 10 SP1)	4	51.5	39840	2950	67.2
SGI Origin 2000 (250 MHz)	128	51.44	61000	10000	64
Cray T932 (2.2 ns) ***	24	51.1	16384	1000	43
Sun Ultra HPC10000 Cluster/2(250 MHz,4MB L2)	128	51.08	44352	12096	64
Cray T3D 512 (150 MHz)	512	50.8	57856	7136	76
HITACHI SR8000-G1/4(450MHz)	4	50.59	31248	1704	57.6
Sun Fire 6900 (UltraSPARC IV, 1.2 GHz)	24	49.64	96116	4100	57.6
IBM System p5 550Q (1.65GHz POWER5+)	8	48.96	57200	840	52.8
Sun Ultra HPC10000 Cluster/4(250 MHz,4MB L2)	128	48.85	80640	10368	64
LANL Avalon Cluster:Alpha 533 Mhz+100Mb/s sw	140	48.6	62720	25200	149.4
HP Integrity rx6600 (1.6GHz/24MB Dual-Core Itanium 2)	8	48.55	47000	920	51.2
SGI2400(Origin 2000)Cluster(4x32 300 MHz)	128	48.33	57600	9500	76.8
Cray SV1ex-1-32, 500MHz	32	48.17	40320	4150	64
Cray X-1 (800 MHz)	4	47.8	41984	3456	51.2
HP 9000 rp7420-16 (1000MHz PA-8800)	16	47.5	30600	1020	64
SGI Origin 200 (2x64 300 MHz w/fast enet)	128	47.49	43000	86300	47.5
Intel Cluster PIII 500 MHz quad w/Giganet+NT4	252	47.38	65520	98280	126
Hewlett-Packard V2600 (552 MHz)	48	47.24	50040	9548	105.9
Compaq Alphaserver GS320 (1001Mhz 4MB L2)	32	47.1	40000	5000	64.0
Hewlett-Packard SuperDome 552 MHz	32	47.01	41000	1472	70.7
IBM eServer pSeries 655/651(1.1GHz Power 4)	16	46.92	75000	4000	70.4
Sun Fire 12K (900MHz/8MB L2$, perflib)	32	46.63	48108	5000	57.6
Sun Ultra HPC6000 Cluster/4(250 MHz,4MB L2)	120	46.56	53760	24192	60
CRAY X1 (800 MHz, 4 procs)	4	46.5	41984	3048	51.2
HP Integrity rx4640 (1.6GHz/24MB Dual-Core Itanium 2)	8	46.31	49000	920	51.2
Cray SV1ex-1-32, 500MHz	30	46.21	39690	4600	60
Fujitsu VPP500/32 (10nsec)	32	46.1	29760	5350	51
Sun Fire 12K (1050MHz/8MB E$)	28	46.04	66166	5500	58.8
Fujitsu VPP700/22 (7nsec)	22	45.9	67320	4840	48.4
SGI Origin 2000 (300 Mhz)	96	45.70	53248	8000	58
IBM System p5 550Q (1.5GHz POWER5+)	8	44.68	65000	820	48.0
Sun HPC 10000(400MHz 8MB L2 Cache)	64	44.57	39936	4032	51.2
HP Integrity rx7620 (1.5GHz Itanium2, 6MB L3 Cache)	8	44.4	33000	1000	48.0
Cray SV1ex-1-32, 500MHz	28	44.28	37044	4000	56
IBM SP2-T2 (66 MHz)	256	44.2	53000	13500	68
HITACHI SR8000/6(250MHz)	6	43.91	28000	2000	48
Sun HPC 10000(400MHz 4MB L2 Cache)	64	43.82	39936	4032	51.2
SGI Origin 3000 400 MHz, 64 CPU	64	43.15	36864	36864	51.2
Cray SV1ex-1-32, 500MHz	27	42.44	35721	4150	54
IBM SP 8 nodes (222 MHz POWER3)	64	41.76	53000	10000	56.8
Sun E6000 "WildFire" 4 servers (250 MHz)	104	41.58	34944	9408	52
SGI Origin 2000 400 MHz, 64 CPU	64	41.53	81920	81920	51.2
CRAY T3E-900 (450 MHz)	64	41.52	43776	4608	58
Fujitsu-Siemens hpcLine(Pentium II,450 MHz)	192	41.45	56480	11136	86.4
Sun HPC 10000(400MHz 4MB L2 Cache)	60	41.19	39936	3840	48.0

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Sun Fire 12K (900MHz/8MB L2$, perflib)	28	40.95	48108	4200	50.4
Hitachi S-3000 cluster/306 (2x3) (2 ns)	6	40.9	27000	2400	48
HITACHI SR8000-F1/4(375MHz)	4	40.76	23000	1720	48
Hitachi S-3000 cluster/206 (3x2) (2 ns)	6	40.6	21600	2160	48
Compaq ES40/EV6 AlphaServer SC	64	40.3	57000		64
SGI Origin 2000 (195 MHz)	128	40.25	60000	6000	49.9
IBM SP 32 nodes (200 MHz POWER3)	64	39.90	63000	7400	51.2
Sun Fire 12K (1050MHz/8MB E$)	24	39.65	66166	4500	50.4
SGI Origin2000 (8x16 250 MHz w/fast enet)	128	39.40	82000	26000	64.0
Cray SV1ex-1-32, 500MHz	25	39.09	34650	4150	50
Sun HPC 10000(400MHz 4MB L2 Cache)	56	38.53	39936	3456	44.8
Sun Ultra HPC6000 Cluster/4(250 MHz,4MB L2)	96	38.44	53760	19968	48
Cray SV1ex-1-32, 500MHz	24	38.31	34776	3700	48
IBM S80s (450 MHz, SP switch)	72	38.25	50000	11000	64.8
Sun E6000 "WildFire" 4 servers (250 MHz)	96	38.13	29568	8064	48
Sun Ultra HPC10000 Cluster/2(250 MHz,4MB L2)	96	37.79	50400	6528	48
Fujitsu VPP5000/4 (3.33nsec)	4	37.60	60384	1584	38.4
SGI Origin 2000 Ether Cluster(250 MHz,4x32)	128	37.31	56000	23000	64
IBM eServer pSeries 655 (1.7GHz POWER4+)	8	37.29	55000	600	54.4
Sun Ultra HPC10000 Cluster/3(250 MHz,4MB L2)	96	36.91	65520	8640	48
Compaq GS140 cluster	64	36.70	40932	5200	67
Cray T932 (2.2 ns) ***	16	36.6	16384	1000	29
Fujitsu VPP300/16E (6.5nsec)	16	36.4	57600	3520	38
Fujitsu VPP700/16E (6.5nsec)	16	36.4	57600	3520	38
IBM SP 2 nodes (375 MHz POWER3 High)	32	36.27	38000	7200	48.0
Sun Fire E6900 (UltraSPARC IV 1.35 Ghz w/custom)	16	36.16	84155	3600	43.2
Hewlett-Packard V2600 (550 MHz)	32	36.01	41000	5040	70.4
Sun HPC 10000(400MHz 4MB L2 Cache)	52	35.83	39936	3264	41.6
Sun Fire 6800 (900MHz/8MB L2)	24	35.63	48108	5000	43.2
HP AlphaServer GS1280 7/1300 (1.3 GHz)	16	35.6	40000		41.6
HITACHI SR8000-E1/4(300MHz)	4	35.57	31248	1600	38.4
Sun Fire 12K (900MHz/8MB L2$, perflib)	24	35.06	48108	3700	43.2
IBM SP 8 nodes (375 MHz POWER3 Thin)	32	34.51	53000	7000	48
NEC SX-4/16 (8.0 ns) ***	16	34.42	14336	960	32
Parnass2 Cluster (PII 400 MHz w/Myricon)	144	34.23	64224	7200	57.6
Sun HPC 10000(333MHz 4MB L2 Cache)	64	34.17	20352	3648	42.6
Fujitsu VPP300/16 (7nsec)	16	34.1	59200	3520	35
Fujitsu VPP700/16 (7nsec)	16	34.1	59200	3520	35
Sun HPC 10000(400MHz 8MB L2 Cache)	48	33.85	39936	3072	38.4
IBM eServer BladeCenter JS21 (2.5 GHz Power PC)	4	33.72	`30800	3700	40.0
Compaq GS140 cluster	56	33.70	40932	4588	58
SGI Origin2000 (6x16 300 MHz w/fast enet)	96	33.61	71500	21000	57.6
Compaq Alphaserver GS320 (731Mhz 4MB L2)	32	33.54	40000	4700	46.8
Sun HPC 10000(400MHz 4MB L2 Cache)	48	33.09	39936	3072	38.4

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Sun Fire 12K (1050MHz/8MB E$)	20	33.08	66166	4500	42.0
Sun Fire 6900 (UltraSPARC IV, 1.2 GHz)	16	32.88	66166	320	38.4
IBM eServer pSeries 655 (1.5GHz POWER4+)	8	32.59	55000	600	48.0
NEC Express5800/1160Xa (800MHz)	16	32.29	62504	7000	51.2
SGI Origin2000 (300 Mhz)	64	32.29	81976	12324	38.4
Sun HPC 10000(333MHz 4MB L2 Cache)	60	32.27	20352	3456	40.0
IBM BladeCenter JS21 dual-core PowerPC 970MP, 2.5 GHz	4	32.22	39100	2052	40.0
Cray SV1ex-1-32, 500MHz	20	32.11	32760	3350	40
Intel Core 2 Q6600 Kensfield) (4 core, 2.4 GHz)	4	31.90	15000	1664	38.4
SGI Origin2000 (3x32 250 MHz w/fast enet)	96	31.84	58000	20000	48.0
NEC SX-8/2 (2 GHz)	2	31.72	30720		32
Paragon XP/S MP(256 Nodes, OS=SUNMOS S1.6)	768	31.7	43500	8400	38
HP V2500 (32 proc. 440 MHz)	32	31.59	41000	4720	56.3
IBM System p5 550 (2.1GHz POWER5+)	4	31.50	53100	500	33.6
hp AlphaServer GS1280 7/1150(1.15 GHz)	16	31.46	40000		36.8
SGI Origin 2000 Ether Cluster(195 MHz,4x32)	128	31.36	56000	21000	50
NEC SX-4/16 (8.0 ns)	16	31.10	20480	960	32
NEC SX-4/16M2 (8.0 ns)	16	31.09	20480	2048 32	
Sun HPC 6500 Cluster/4 (250 MHz, 4MB L2)	80	30.98	24192	13440	40
DEC AlphaServer 8400 5/612 (625 MHz)	64	30.90	30704	8360	80
NEC SX-4/16A (8.0 ns)	16	30.83	20480	960	32
Cray SV1-1-32 (300 MHz)	32	30.72	40320	4150	39.2
SGI Origin 2000 Ether Cluster(250 MHz,3x32)	96	30.70	49000	17000	48
Thinking Machines CM-5	512	30.4	36864	16384	66
Sun HPC 10000(400MHz 4MB L2 Cache)	44	30.33	39936	2688	35.2
Sun HPC 10000(333MHz 4MB L2 Cache)	56	30.27	20352	3264	37.3
ClearSpeed CSX600 Advance accelerator boards (250 MHz) (frontend IBM Intellistation (dual Opteron 250 2.4 GHz PCI-X board)	3	30.2	20256	4712	100.8
Cray SV1-1-32 (300 MHz)	30	30.04	39690	4600	36
Sun Fire 6800 (750MHz/8MB L2$)	24	29.65	48108		36
Hitachi SR2201/128(150MHz)	128	29.46	51840	7680	38.4
IBM SP2 (160 MHz)	64	29.45	27500	5700	41
Sun Fire 12K (900MHz/8MB L2$, perflib)	20	29.30	48108	3300	36.0
HITACHI SR8000/4(250MHz)	4	29.1	21464	1600	32
IBM SP2-T2 (66 MHz)	160	28.7	42200	10300	42
Compaq GS140 cluster	48	28.58	40932	4200	50
Cray T3E-1350 (675 MHz)	32	28.5	44544	3456	43.2
IBM System p5 550 (1.9GHz POWER5+)	4	28.49	53100	250	30.0
IBM eServer pSeries 650 6M2(1.45GHz POWER4+)	8	28.41	60000	600	46.4
Hitachi S-3800/480 (2 ns)	4	28.4	15500	830	32
Sun HPC 10000(333MHz 4MB L2 Cache)	52	28.32	20352	3072	34.6
CRAY T3E (300 MHz)	64	28.31	29952	4032	38.4
IBM SP 16 nodes (332 MHz 604e)	64	28.12	36000	6760	42

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Cray SV1-1-32 (300 MHz)	28	28.01	37044	4000	33.6
Hitachi S-3000 cluster/204 (2x2) (2 ns)	4	27.9	21600	1640	32
HP Exemplar X-Class SPP-UX 5.2	64	27.56	29956	4584	46
Sun HPC 10000(400MHz 4MB L2 Cache)	40	27.56	39936	2496	32.0
IBM eServer p5 570 (1900 MHz POWER5)	4	27.52	38000	1400	30.40
IBM S80s (450 MHz, SP switch)	48	27.28	41000	9000	43.2
Hitachi S-3000 cluster/404 (1x4) (2 ns)	4	27.2	31200	2680	32
CRAY SV1-1-32 (300 MHz)	27	26.82	35721	4150	32
SGI POWER CHALLENGE (90 MHz)	128	26.7	53000	20000	46
CRAY T3E-1200E (600 MHz)	32	26.58	44544	3456	38.4
Sun Fire 12K (1050MHz/8MB E$)	16	26.57	66166	3500	33.6
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	64	26.45	19968	3072	32
Sun HPC 10000(333MHz 4MB L2 Cache)	48	26.38	20352	2880	32.0
SGI Origin 2000 (250 MHz)	64	26.24	43520	5200	32
HITACHI SR8000-G1/2(450MHz)	2	25.55	23000	1256	28.8
Sun HPC 6500 Cluster/4 (250 MHz, 4MB L2)	64	25.40	26880	10752	32
DEC AlphaServer 8400 5/612 (625 MHz)	56	25.39	26864	8360	70
Cray T3D 256 (150 MHz)	256	25.3	40960	4918	38
Compaq GS140 cluster	40	25.17	40932	3824	42
CRAY SV1-1-32 (300 MHz)	25	25.02	34650	4150	30
HP Integrity rx4640-8 (1.6GHz/9MB Itanium 2)	4	24.49	38680	560	25.6
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	60	24.83	19968	2800	30
Sun HPC 10000(400MHz 4MB L2 Cache)	36	24.77	39936	2304	28.8
Sun Fire 6800 (750MHz/8MB L2$)	20	24.71	48108		30
DEC 8400 5/440 (440 MHz)	64	24.7	30712	4584	56.3
IBM BladeCenter JS12 Express (3.8 GHz POWER6 RHEL 5.1)	2	24.67	55000	2500	30.4
HP V2500 (24 proc. 440 MHz)	24	24.64	41000	3120	42.2
HP Integrity rx3600 (1.6GHz/18MB Dual-Core Itanium 2)	4	24.61	39480	560	25.6
SGI Origin 2000 Ether Cluster(195 MHz,3x32)	96	24.58	49000	15000	37
HP Integrity rx2660 (1.6GHz/18MB Dual-Core Itanium 2)	4	24.54	38760	560	25.6
HP Integrity BL860c (1.6GHz/18MB Dual-Core Itanium 2)	4	24.48	34920	560	25.6
Sun HPC 10000(333MHz 4MB L2 Cache)	44	24.36	20352	2688	29.3
HP Integrity rx2620 (1.6GHz/18MB Dual Core Itanium 2)	4	24.22	38000	560	25.6
Cray SV1ex-1-32, 500MHz	16	24.22	30240	2950	32
IBM eServer OpenPower 720 (1.65GHz POWER5)	4	24.12	63000	1500	26.40
Sun Fire 6800 (900MHz/8MB L2)	16	24.12	48108	3500	28.8
Cray SV1-1-32 (300 MHz)	24	24.03	34776	3700	28.8
Fujitsu VPP500/16 (10nsec)	16	23.6	21120	3360	26
SGI Origin 300 (500 MHz)	32	23.59	29000	29000	32
IBM eServer p5 550 (1650 MHz POWER5)	4	23.57	62000	1600	26.4
Sun Fire 12K (900MHz/8MB L2$, perflib)	16	23.48	48108	2800	28.8
IBM eServer pSeries 655/651(1.1GHz Power 4)	8	23.47	53000	600	35.2
IBM SP2 thin-node2,SP-sw,256MB/node(66 MHz)	128	23.45	56000	9200	33.6
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	56	23.38	19968	2880	28

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
NEC SX-3/44R (2.5 ns)	4	23.2	6400	830	26
IBM SP2-T2 (66 MHz)	128	22.9	37000	9200	34
Sun HPC 10000(400MHz 8MB L2 Cache)	32	22.63	39936	2112	25.6
IBM POWER2 Super Chip RS/6000 SP(120 MHz)	64	22.55	27400	6500	31
IBM eServer pSeries 655 651(1.1GHz POWER4)	8	22.34	36000	600	35.2
Sun HPC 10000(333MHz 4MB L2 Cache)	40	22.27	20352	2496	26.6
Sun HPC 10000(400MHz 4MB L2 Cache)	32	21.98	39936	2112	25.6
HP Integrity rx3600 (1.4GHz/12MB Dual-Core Itanium 2)	4	21.83	39000	560	25.6
DEC 8400 5/440 (440 MHz)	56	21.8	26856	4072	49.3
HP Integrity Server rx5670 (1500MHz, 6.0MB L3 Cache)	4	21.713	51040	500	24.0
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	52	21.68	19968	2496	26
IBM eServer p5 550 Express (1500 MHz POWER5)	4	21.64	53000	500	24.0
Sun HPC 6500(400MHz 8MB L2 Cache)	30	21.61	39936	2688	24.0
Hitachi S-3800/380 (2 ns)	3	21.6	15680	760	24
Hitachi S-3000 cluster/303 (1x3) (2 ns)	3	21.5	27000	1560	24
HP Integrity rx2620 (1.4GHz/12MB Dual Core Itanium 2)	4	21.41	36760	560	25.6
Sun Ultra HPC 10000(250 MHz 1MB L2 Cache)	64	21.37	15000	4200	32.0
Sun Ultra HPC 10000(250 MHz 1MB L2 Cache)	63	21.14	15000	4200	31.5
SGI Origin 2000 Ether Cluster(250 MHz,2x32)	64	21.05	40000	14000	32
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	50	21.05	19968	2496	25
IBM SP 4 nodes (222 MHz POWER3)	32	21.00	38000	5200	28.4
CRAY T3E-900 (450 MHz)	32	20.86	31104	3072	29
SGI Origin 2000 (195 MHz)	64	20.75	43520	4608	25.0
Cray C90 (240 MHz)***	16	20.65	13312	700	15
DEC AlphaServer 8400 5/612 (625 MHz)	40	20.54	24552	8960	50
HITACHI SR8000-F1/2(375MHz)	2	20.50	15176	1208	24
Hewlett-Packard V2600 (550 MHz)	16	20.45	41000	2040	35.2
Sun Ultra HPC 10000(250 MHz 1MB L2 Cache)	60	20.31	15000	3600	30.0
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	48	20.30	19968	2496	24
Compaq GS140 cluster	32	20.22	30712	3056	34
Sun HPC 6500(400MHz 8MB L2 Cache)	28	20.20	39936	2496	22.4
Cray SV1-1-32 (300 MHz)	20	20.18	32760	3350	24
Sun HPC 10000(333MHz 4MB L2 Cache)	36	20.11	20352	2304	24.0
NEC SX-3/44 (2.9 ns)	4	20.0	6144	832	22
IBM SP 16 nodes (200 MHz POWER3)	32	19.92	44800	4750	25.6
Sun Fire 6800 (750MHz/8MB L2$)	16	19.90	48108		24
Sun HPC 6500 Cluster/2 (250 MHz, 4MB L2)	48	19.42	18816	5376	24
LANL Avalon Cluster:Alpha 533 Mhz+100Mb/s sw	68	19.33	30464	14376	72.5
Cray SV1ex-1-32, 500MHz	12	19.26	25704	2700	24
DEC 8400 5/440 (440 MHz)	48	19.2	23032	4048	42.2
Sun HPC 10000(400MHz 4MB L2 Cache)	28	19.16	39936	1920	22.4
Sun Ultra HPC 10000(250 MHz 1MB L2 Cache)	56	19.14	15000	3600	28.0
IBM eServer pSeries 655 (1.7GHz POWER4+)	4	18.99	38000	400	27.2
IBM eServer BladeCenter JS21 (2.7 GHz Power PC)	2	18.96	30800	2500	21.6

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Fujitsu VPP5000/2 (3.33nsec)	2	18.82	42720	1056	19.2
Sun HPC 6500(400MHz 8MB L2 Cache)	26	18.78	39936	2304	20.8
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	44	18.67	19968	2496	22
Fujitsu VPP300/8E (6.5nsec)	8	18.6	41600	2400	19
Fujitsu VPP700/8E (6.5nsec)	8	18.6	41600	2400	19
SGI POWER CHALLENGE (75 MHz)	96	18.5	53000	20000	29
Thinking Machines CM-200 (half precision)	2048	18.5	39936	14336	40
IBM SP 1 node (375 MHz POWER3 High)	16	18.25	27000	1300	24.0
Sun Fire 6800 (900MHz/8MB L2)	12	18.17	48108	2680	21.6
Sun Fire E6900 (UltraSPARC IV 1.35 Ghz w/custom)	8	17.98	60118	2200	21.6
DEC AlphaServer 8400 5/612 (625 MHz)	32	17.96	25624	4088	40
HP AlphaServer GS1280 7/1300 (1.3 GHz)	8	17.93	32768		20.8
Sun HPC 10000(333MHz 4MB L2 Cache)	32	17.91	20352	2112	21.3
Sun HPC 6000(336MHz 4MB L2 Cache)	30	17.89	20352	2112	20.2
IBM SP 4 nodes (375 MHz POWER3 Thin)	16	17.66	38000	3300	24
IBM BladeCenter JS21 dual-core PowerPC 970MP, 2.7 GHz	2	17.65	41000	600	21.6
IBM Power 570 (5.0 GHz POWER6)	1	17.47	20000	280	20.0
HP V2500 (16 proc. 440 MHz)	16	17.47	41000	1580	28.2
SGI Origin 2000 Ether Cluster(195 MHz,2x32)	64	17.46	40000	13000	25
NEC SX-3/34R (2.5 ns)	3	17.4	6144	691	19
Sun HPC 6500(400MHz 8MB L2 Cache)	24	17.35	39936	2112	19.2
Intel Core 2 Q6600 Kensfield) (2 core, 2.4 GHz)	2	17.25	15000	1664	19.2
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	40	17.12	19968	2496	20
Fujitsu VPP300/8 (7nsec)	8	17.1	41600	2080	18
Fujitsu VPP700/8 (7nsec)	8	17.1	41600	2080	18
Sun HPC 6000(336MHz 4MB L2 Cache)	28	16.74	20352	2112	18.8
Sun Ultra2/2200 Sparc Cluster	32	16.71	28416	9216	25.6
DEC 8400 5/440 (440 MHz)	40	16.7	20456	3200	35.2
Sun Ultra HPC 10000(250 MHz 1MB L2 Cache)	48	16.66	15000	3600	24.0
IBM Power 595 (5.0 GHz POWER6)	1	16.4	22900	300	20
Sun HPC 10000(400MHz 4MB L2 Cache)	24	16.39	39936	1728	19.2
Sun Fire 6900 (UltraSPARC IV, 1.2 GHz)	8	16.36	48108	220	19.2
Cray SV1-1-32 (300 MHz)	16	16.23	30240	2950	19.6
Paragon XP/S MP(128 Nodes, OS=SUNMOS S1.6)	384	16.0	30700	5700	19
Cray C90 (240 MHz)***	12	15.97	13312	600	12
Sun HPC 4500 Cluster/4 (250 MHz, 4MB L2)	44	15.96	26880	8064	22
Sun HPC 6500(400MHz 8MB L2 Cache)	22	15.92	39936	1920	17.6
IBM IntelliStation POWER 285 (2.1 GHz Power5+)	2	15.88	41100	310	16.8
NEC SX-8/1 (2 GHz)	1	15.87	30720		16
SGI Origin 2000 (300 Mhz)	32	15.77	30720	4500	19
hp AlphaServer GS1280 7/1150(1.15 GHz)	8	15.72	30000		18.4
Sun HPC 10000(333MHz 4MB L2 Cache)	28	15.66	20352	1728	18.6
HP AlphaServer ES80 7/1150 (1.15 GHz)	8	15.62	30000		18.4
SGI POWER CHALLENGE (90 MHz)	64	15.6	37000	8500	23

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Sun HPC 6000(336MHz 4MB L2 Cache)	26	15.59	20352	1920	17.5
IBM Power 570 (4.7GHz POWER6)	1	15.53	26600	280	18.8
NEC SX-4/8M2 (8.0 ns)	8	15.44	9984	1920 16	
NEC SX-4/8 (8.0 ns)	8	15.43	9984	860	16
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	36	15.42	19968	2112	18
IBM eServer pSeries 630 6C4 (1.45GHz POWER4+)	4	15.34	38000	400	23.2
IBM eServer pSeries 630 6E4 (1.45GHz POWER4+)	4	15.34	38000	400	23.2
Compaq GS140 cluster	24	15.31	30712	2200	25
NEC SX-4/8A (8.0 ns)	8	15.31	9984	860	16
IBM IntelliStation POWER 185 (2.5GHz)	2	15.28	29000	1400	20.0
IBM System p5 185 (2.5GHz)	2	15.28	29000	1400	20.0
Intel Paragon XPS-35 (50 MHz, OS=R1.1)	512	15.2	23000	9000	26
IBM S80 (450 MHz)	24	15.17	29000	4400	21.6
hp server rx5670 (1000MHz, 3.0MB L3 Cache)	4	15.13	37920	1440	16
Thinking Machines CM-5	256	15.1	26112	12032	33
HP Exemplar X-Class SPP-UX 5.2	32	15.01	26848	1840	23
IBM Power 575 (4.7 GHz POWER6)	1	15.0	19500	300	19
Sun Fire 6800 (750MHz/8MB L2$)	12	14.96	48108		18
IBM SP2 (160 MHz)	32	14.93	20000	3840	20
HITACHI SR2201/64(150MHz)	64	14.89	38880	6720	19
Hitachi S-3800/280 (2 ns)	2	14.6	15680	570	16
HITACHI SR8000/2(250MHz)	2	14.6	15176	1192	16
IBM Power 570 (4.2 GHz POWER6)	1	14.57	20000	360	16.8
Sun HPC 10000(333MHz 4MB L2 Cache)	26	14.53	20352	1728	17.3
Hitachi S-3000 cluster/202 (1x2) (2 ns)	2	14.5	21600	1100	16
IBM SP2 (77 MHz, switch of 4/96)	64	14.5	27000	5100	20
Sun HPC 6000(336MHz 4MB L2 Cache)	24	14.49	20352	1728	16.1
Sun HPC 6500(400MHz 8MB L2 Cache)	20	14.49	39936	1728	16.0
IBM eServer pSeries 650 6M2(1.45GHz POWER4+)	4	14.48	36000	400	23.2
Cray T3E-1350 (675 MHz)	16	14.4	31680	2352	21.6
IBM IntelliStation POWER 285 Workstation (1.9 GHz POWER5+)	2	14.35	41200	300	15.2
IBM System p5 505 (1.9 GHz POWER5+)	2	14.31	41200	300	15.2
Sun Ultra HPC 10000(250 MHz 1MB L2 Cache)	40	14.06	15000	3000	20.0
CRAY T3E (300 MHz)	32	14.03	21120	2832	19.2
Intel Delta (40 MHz)	512	13.9	25000	7500	20
DEC AlphaServer 8400 5/612 (625 MHz)	24	13.79	25624	3072	30
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	32	13.77	19968	1920	16
Sun HPC 10000(400MHz 4MB L2 Cache)	20	13.74	39936	1536	16.0
Cray Y-MP C90 (240 MHz 4.2 ns)	16	13.7	10000	650	15
DEC 8400 5/440 (440 MHz)	32	13.7	19176	4584	28.2
IBM Power 550 (4.2GHz POWER6)	1	13.60	26500	360	16.8
hp server rx5670 (900MHz, 1.5MB L3 Cache)	4	13.53	37920	1440	14.4
IBM Power 520 (4.2GHz POWER6)	1	13.53	23700	300	16.8

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM eServer pSeries 655 651(1.3GHz POWER4)	4	13.52	36000	400	20.8
CRAY T3E-1200E (600 MHz)	16	13.41	31680	2304	19.2
Sun HPC 10000(333MHz 4MB L2 Cache)	24	13.39	20352	1728	16.0
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	30	13.39	19968	1920	15
Sun HPC 6000(336MHz 4MB L2 Cache)	22	13.33	20352	1728	14.8
IBM eServer BladeCenter JS20 (2.2GHz Power PC)	2	13.27	20000	2100	17.60
SGI Origin 2000 (250 MHz)	32	13.22	30720	3200	16
Sun HPC 6500(400MHz 8MB L2 Cache)	18	13.05	39936	1536	14.4
IBM eServer pSeries 630 6C4(1.2GHz POWER4+)	4	13.03	38000	400	19.2
IBM eServer pSeries 630 6E4(1.2GHz POWER4+)	4	13.03	38000	400	19.2
HITACHI SR8000-G1/1(450MHz)	1	13.0	16000	888	14.4
HITACHI SR2201/56(150MHz)	56	12.98	33600	4480	17
Cray SV1ex-1-32, 500MHz	8	12.96	21672	1900	16
Sun HPC 6500 Cluster/2 (250 MHz, 4MB L2)	32	12.85	17472	5376	16
Cray T3D 128 (150 MHz)	128	12.8	20736	3408	19
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	28	12.53	19968	1728	14
IBM SP2 thin-node2,SP-sw,256MB/node(66 MHz)	64	12.50	39000	7000	16.8
Intel Paragon XPS-35 (50 MHz)	296	12.5	29400	5000	15
IBM System p5 505 (1.65GHz POWER5)	2	12.47	30500	1000	13.2
Sun Ultra HPC 6000 250 MHz (1MB L2 Cache)	30	12.42	15700	4000	15.0
IBM System p5 505 (1.65 GHz POWER5)	2	12.39	41200	310	13.2
DEC 4100 5/400 (400 MHz)	32	12.37	15340	6120	25.6
Hewlett-Packard N4000 (550 MHz)	8	12.37	28000	540	17.6
Sun HPC 10000(333MHz 4MB L2 Cache)	22	12.32	20352	1536	14.7
Cray SV1-1-32 (300 MHz)	12	12.18	25704	2700	14.7
IBM eServer p5 510 (1.65GHz POWER5)	2	12.14	46000	300	13.2
Sun HPC 6000(336MHz 4MB L2 Cache)	20	12.13	20352	1536	13.4
IBM eServer OpenPower 710 (1.65GHz POWER5)	2	12.12	63000	1400	13.20
HP Integrity rx1620-2 (1.6GHz/3MB Itanium 2)	2	12.05	29000	360	12.8
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	28	12.05	19968	1728	14
Fujitsu VPP500/8 (10nsec)	8	12.0	14960	2216	13
HP Integrity rx2620-2 (1.6GHz/3MB Itanium 2)	2	11.98	29000	360	12.8
Sun Fire 6800 (900MHz/8MB L2)	8	11.98	28956	1800	14.4
IBM eServer p5 520 (1650 MHz POWER5)	2	11.78	58000	320	13.2
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	26	11.66	19968	1728	13
NEC SX-3/24R (2.5 ns)	2	11.6	4352	492	13
NEC SX-3/42R (2.5 ns)	4	11.6	4352	516	13
Sun HPC 6500(400MHz 8MB L2 Cache)	16	11.60	39936	1536	12.8
HP Integrity Server rx5670 (1500MHz, 6.0MB L3 Cache)	2	11.490	35016	300	12.0
HP Integrity Server rx2600 (1500MHz, 6.0MB L3 Cache)	2	11.420	35000	300	12.0
IBM SP2-T2 (66 MHz)	64	11.4	26500	6250	16
IBM POWER2 Super Chip RS/6000 SP(120 MHz)	32	11.38	19500	4100	15
Sun Ultra HPC 10000(250 MHz 1MB L2 Cache)	32	11.34	15000	2400	16.0
Sun HPC 10000(333MHz 4MB L2 Cache)	20	11.24	20352	1536	13.3

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Dell PE3250 server (Itanium 2 1.5 GHz, 1.5MB L3 Cache)	2	11.23	24000		12
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	26	11.20	19968	1728	13
Sun HPC 10000(400MHz 4MB L2 Cache)	16	11.11	39936	1344	12.8
IBM SP 2 nodes (222 MHz POWER3)	16	11.08	27000	3000	14.2
Compaq GS140 cluster	16	11.01	30712	1200	17
Sun HPC 6000(336MHz 4MB L2 Cache)	18	10.94	20352	1344	12.1
Cray C90 (240 MHz)***	8	10.93	13312	490	7.7
DEC 8400 5/440 (440 MHz)	24	10.9	15340	4088	21.1
SGI Origin 2000 (195 MHz, 4MB L2 Cache)	32	10.9	32000	6400	12.5
HITACHI SR8000-F1/1(375MHz)	1	10.88	10728	880	12
IBM eServer p5 520 Express (1500 MHz POWER5)	2	10.85	38000	300	12.0
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	24	10.78	19968	1728	12
HP Exemplar V-Class (240 MHz)	16	10.65	14944	896	15
Hewlett-Packard V2600 (550 MHz)	8	10.59	41000	880	17.6
CRAY T3E-900 (450 MHz)	16	10.45	22080	2016	14
Thinking Machines CM-2 (half precision)	2048	10.4	33920	14000	28
Intel Itanium 1.396 GHz Dual	2	10.36	15000		2.8
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	24	10.35	19968	1728	12
IBM SP 8 nodes (332 MHz 604e)	32	10.33	31600	5000	21
HP N4000 (440 MHz)	8	10.22	28000	516	14
Intel Delta (40 MHz)	384	10.2	20000	6000	15
Dell PE3250 server (Itanium 2 1.4 GHz, 1.5MB L3 Cache)	2	10.18	24000		11.2
Sun HPC 6500(400MHz 8MB L2 Cache)	14	10.16	39936	1344	11.2
Berkeley NOW:UltraSPARC-1(167-Mhz)+Myricom	100	10.14	32768	8192	33.4
Sun HPC 4500(400MHz 4MB L2 Cache)	14	10.05	20352	1344	11.2
IBM SP 8 nodes (200 MHz POWER3)	16	10.04	31600	2900	12.8
NEC SX-3/24 (2.9 ns)	2	10.0	4352	500	11
NEC SX-3/42 (2.9 ns)	4	10.0	4608	640	11
Sun Ultra HPC 6000 250 MHz (1MB L2 Cache)	24	9.992	15700	1632	12.0
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	22	9.887	19968	1728	11
Sun Fire 6800 (750MHz/8MB L2$)	8	9.848	15180		12
Thinking Machines CM-200 (10 MHz)	2048	9.8	29696	11264	20
Intel Itanium 2 1.3 GHz	2	9.754	24000		10.4
Sun HPC 6000(336MHz 4MB L2 Cache)	16	9.715	20352	1344	10.8
DEC AlphaServer 8400 5/612 (625 MHz)	16	9.592	25624	3072	20
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	22	9.513	19968	1728	11
DEC 4100 5/400 (400 MHz)	24	9.48	15344	3600	19.2
Fujitsu VPP5000/1 (3.33nsec)	1	9.475	30000	340	9.6
Cray T94 (2.2 ns) ***	4	9.414	8192	420	7.2
SGI POWER CHALLENGE (90 MHz)	40	9.4	27000	6775	14
Fujitsu VPP300/4E (6.5nsec)	4	9.33	28800	1280	9.6
Fujitsu VPP700/4E (6.5nsec)	4	9.33	28800	1280	9.6
Fujitsu VX/4E (6.5nsec)	4	9.33	28800	1280	9.6

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
HP V2500 (8 proc. 440 MHz)	8	9.26	41000	800	14.1
HP Exemplar V-Class (200 MHz)	16	9.203	14944	868	12.8
Sun HPC 10000(333MHz 4MB L2 Cache)	16	9.107	20352	1344	10.7
IBM SP 2 nodes (375 MHz POWER3 Thin)	8	9.09	27000	1700	12
HITACHI SR8000-E1/1(300MHz)	1	9.047	16000	792	9.6
HP AlphaServer GS1280 7/1300 (1.3 GHz)	4	9.04	26000		10.4
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	20	8.997	19968	1344	10
Intel Core 2 Q6600 Kensfield) (1 core, 2.4 GHz)	1	8.878	15000	1664	9.6
SGI Origin 2000 (300 Mhz)	16	8.712	24580	1156	9.6
Sun HPC 6500(400MHz 8MB L2 Cache)	12	8.711	39936	1344	9.6
NEC SX-3/32R (2.5 ns)	3	8.7	6144	717	9.6
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	20	8.679	19968	1344	10
Fujitsu VPP300/4 (7nsec)	4	8.6	28800	1280	8.8
Fujitsu VPP700/4 (7nsec)	4	8.6	28800	1280	8.8
Fujitsu VX/4 (7nsec)	4	8.6	28800	1280	8.8
Sun HPC 6000(336MHz 4MB L2 Cache)	14	8.527	20352	1344	9.4
IBM System p5 575 (2.2GHz POWER5+)	1	8.33	20300	260	8.8
Cray C90 (240 MHz)***	6	8.29	13312	450	5.8
SGI POWER CHALLENGE (195 MHz, 2MB cache)	32	8.233	16000	4000	12
HP Exemplar V-Class (240 MHz)	12	8.228	14944	736	11.5
Cray SV1-1-32 (300 MHz)	8	8.150	21672	1900	9.6
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	18	8.113	19968	1344	9
Parsytec GC/Power Plus (80 MHz)	192	8.0	27192	9500	15
HP AlphaServer ES80 7/1150 (1.15 GHz)	4	7.93	26000		9.2
HP AlphaServer ES47 7/1150 (1.15 GHz)	4	7.93	26000		9.2
SGI Origin 2000 (195 MHz, 4MB cache)	24	7.928	19000	3500	9.4
hp AlphaServer GS1280 7/1150(1.15 GHz)	4	7.82	20000		9.2
Sun Ultra HPC 6000 167 MHz (1MB L2 Cache)	30	7.806	14000	1000	10.0
Paderborn SCI Cluster:SNI/Scali(300MHz PII)	64	7.8	28000	8000	19.2
SGI POWER CHALLENGE (75 MHz)	40	7.8	27000	6775	12
HP Exemplar S-Class SPP-UX 5.2	16	7.783	13320	1044	11.5
DEC 8400 5/440 (440 MHz)	16	7.7	15340	3270	14.1
Thinking Machines CM-5	128	7.7	18432	8192	16
IBM IntelliStation POWER 275 (1.45GHz POWER4+)	2	7.69	26000	300	11.6
SGI POWER CHALLENGE (195 MHz, 2MB cache)	28	7.635	15000	4000	11
Cray J932 (10 ns) ***	32	7.622	19456	800	6.4
Intel Paragon XPS-35 (50 MHz, OS=R1.1)	256	7.6	16000	4000	13
IBM SP2 (160 MHz)	16	7.57	13500	2280	10
HITACHI SR8000/1(250MHz)	1	7.50	10728	696	8
SGI POWER CHALLENGE (90 MHz)	32	7.5	22000	5600	16
Cray J928 (10 ns) ***	28	7.413	19456	750	5.6
Hitachi S-3800/180 (2 ns)	1	7.4	15680	470	8
IBM SP2 (77 MHz, switch of 4/96)	32	7.3	19500	3500	10
DEC 8400 5/625 (612 MHz)	12	7.283	9548	1800	14.7

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM System p5 505 (1.9 GHz POWER5+)	1	7.281	29100	200	7.6
IBM eServer pSeries 650 6M2(1.45GHz POWER4+)	2	7.28	24000	300	11.6
Sun HPC 6500(400MHz 8MB L2 Cache)	10	7.266	39936	1344	8.0
IBM System p5 550 (1.9GHz POWER5+)	1	7.254	26550	230	7.6
Sun Ultra HPC 6000(250 MHz 4MB L2 Cache)	16	7.219	19968	1344	8
Cray T3E-1350 (675 MHz)	8	7.2	22272	1536	10.8
IBM System p5 575 (1.9GHz POWER5+)	1	7.14	23100	820	7.6
CRAY T3E (300 MHz)	16	7.133	14976	1728	9.6
IBM eServer p5 575 (1.9GHz POWER5)	1	7.12	40000	230	7.6
Cray T94 (2.2 ns) ***	3	7.112	8192	370	5.4
HP Exemplar V-Class (200 MHz)	12	7.094	14944	696	9.6
Sun Ultra HPC 10000(250 MHz 4MB L2 Cache)	16	7.023	19968	1344	8
Intel Delta (40 MHz)	256	7.0	18000	5000	10
DEC 4100 5/400 (400 MHz)	16	6.89	15344	2760	12.8
SGI POWER CHALLENGE (195 MHz, 2MB cache)	24	6.819	15000	3500	9.4
IBM System p5 560Q (1.5GHz POWER5)	1	6.8	23100	200	7.2
Sun Ultra HPC 6000 250 MHz (1MB L2 Cache)	16	6.688	15700	1088	8.0
DEC Alphaserver 8400 5/440(440MHz, 4MB cache)	12	6.678	9548	1028	10.6
CRAY T3E-1200E (600 MHz)	8	6.674	22272	1536	9.6
Cray J924 (10 ns) ***	24	6.645	19456	700	4.8
IBM SP2 thin-node2,SP-sw,256MB/node(66 MHz)	32	6.569	28000	5200	8.4
Hewlett-Packard N4000 (550 MHz)	4	6.568	28000	376	8.8
Cray SV1ex-1-32, 500MHz	4	6.527	15372	1250	8
Compaq Alphaserver ES45 (1001Mhz 8MB L2)	4	6.435	14000	1050	8.0
Cray T3D 64 (150 MHz)	64	6.4	20736	2368	9.6
Sun Ultra HPC 6000 167 MHz (1MB L2 Cache)	24	6.350	14000	800	8.0
Sun Ultra HPC 6000 250 MHz (4MB L2 Cache)	14	6.251	15552	1152	7.0
IBM System p5 505 (1.65 GHz POWER5)	1	6.231	29100	200	6.6
Convex SPP-1000(64 procs)100 MHz	64	6.192	41000	11400	12.8
SGI POWER CHALLENGE (195 MHz, 1 MB cache)	24	6.118	15000	3100	9.3
Fujitsu VPP500/4 (10nsec)	4	6.1	10560	1390	6.4
Sun Fire 6800 (900MHz/8MB L2)	4	6.016	28956	1200	7.2
HP Exemplar S-Class SPP-UX 5.2	12	6.005	13320	800	8.6
Cray J920 (10 ns) ***	20	5.917	19456	675	4.0
DEC 8400 5/350 (12 proc 350 MHz)	12	5.904	9548	3010	8.4
SGI POWER CHALLENGE (195 MHz, 2MB cache)	20	5.872	15000	3000	7.8
Sun Ultra HPC 6000 250 MHz (1MB L2 Cache)	14	5.856	15700	960	7.0
DEC Alphaserver 8400 5/440(440MHz, 4MB cache)	10	5.845	9548	1124	8.8
SGI POWER CHALLENGE (195 MHz, 1 MB cache)	22	5.812	15000	2900	8.6
Sun HPC 6500(400MHz 8MB L2 Cache)	8	5.810	39936	1344	6.4
IBM SP2-T2 (66 MHz)	32	5.8	18000	4500	8.4
NEC SX-3/14R (2.5 ns)	1	5.8	2816	282	6.4
NEC SX-3/22R (2.5 ns)	2	5.8	3072	370	6.4
NEC SX-3/41R (2.5 ns)	4	5.8	3584	414	6.4
Sun HPC 4500(400MHz 4MB L2 Cache)	8	5.772	20352	960	6.4

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
IBM POWER2 Super Chip RS/6000 SP(120 MHz)	16	5.767	13500	2600	7.7
Cray C90 (240 MHz)***	4	5.75	13312	420	3.8
HP Integrity Server rx2600 (1500MHz, 6.0MB L3 Cache)	1	5.711	30000	300	6.0
HP Integrity Server rx5670 (1500MHz, 6.0MB L3 Cache)	1	5.683	35016	300	6.0
HP Exemplar V-Class (240 MHz)	8	5.657	14944	560	7.68
Hewlett-Packard V2600 (550 MHz)	4	5.650	41000	600	8.8
IBM System p5 560Q (1.8GHz POWER5+)	1	5.65	23000	240	6.0
IBM GF11** (half precision) (51.9 ns)	500	5.6	2500	1060	9.6
IBM System p5 550Q (1.5GHz POWER5+)	1	5.596	20500	220	6.0
IBM SP 1 node (222 MHz POWER3)	8	5.54	13000	800	7.1
Convex SPP-1600(32 procs)120 MHz	32	5.452	27000	4500	7.7
SGI POWER CHALLENGE (195 MHz, 1 MB cache)	20	5.430	15000	2600	7.8
HP N4000 (440 MHz)	4	5.394	28000	356	7.0
IBM SP 4 nodes (332 MHz 604e)	16	5.37	22400	3200	11
SGI Origin 2000 (195 MHz, 4MB cache)	16	5.300	16000	1000	6.2
CRAY T3E-900 (450 MHz)	8	5.243	15552	1488	7.2
Intel Delta (40 MHz)	192	5.2	15000	4500	7.7
Parsytec GC/Power Plus (80 MHz)	128	5.2	22000	7800	10
Thinking Machines CM-2 (7 MHz)	2048	5.2	26624	11000	14
IBM SP 4 nodes (200 MHz POWER3)	8	5.13	22400	1600	6.4
Compaq ES40/EV67 AlphaServer SC (833 MHz)	4	5.105	12800	1000	6.66
DEC AlphaServer 8400 5/300	12	5.0	9548	1148	7.2
Meiko CS2	64	5.0	18688	6144	11.5
NEC SX-3/14 (2.9 ns)	1	5.0	3072	384	5.5
NEC SX-3/22 (2.9 ns)	2	5.0	3072	384	5.5
Thinking Machines CM-200 (10 MHz)	1024	5.0	21504	8192	10
SGI POWER CHALLENGE (195 MHz, 2MB cache)	18	4.992	15000	2350	7.0
Sun Fire 6800 (750MHz/8MB L2$)	4	4.968	15180		6
Intel Pentium 4 3.0 GHz (Northwood core)	1	4.937	12800		6
Cray J916 (10 ns) ***	16	4.911	19456	640	3.2
SGI POWER CHALLENGE (75 MHz)	24	4.9	18000	3500	7.2
Cray T94 (2.2 ns) ***	2	4.886	8192	350	3.6
Sun HPC 6000(336MHz 4MB L2 Cache)	8	4.886	20352	960	5.4
IBM eServer pSeries 655 (1.7GHz POWER4+)	1	4.87	38000	200	6.8
SGI POWER CHALLENGE (195 MHz, 2MB cache)	16	4.862	15000	2500	6.2
HP Exemplar V-Class (200 MHz)	8	4.860	14944	552	6.4
Alliant CAMPUS/800 (40 MHz)	192	4.8	17024	5768	7.7
IBM SP-1	64	4.8	26000	6000	8
DEC Alphaserver 8400 5/440(440MHz, 4MB cache)	8	4.754	7644	1500	7.0
HP V2500 (4 proc. 440 MHz)	4	4.70	41000	600	7.04
IBM eServer pSeries 640 (375 MHz, 8MB L2)	4	4.64	19000	340	6
IBM RS/6000 44P-270 (375 MHz, 8MB L2)	4	4.64	19000	340	6
IBM RS/6000 44P-270 (4 proc,375 MHz,8 MB L2)	4	4.64	19000	340	6
IBM SP 1 node (375 MHz POWER3 Thin)	4	4.62	19000	440	6

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
SGI POWER CHALLENGE (90 MHz)	18	4.620	2500	540	6.5
Intel Pentium 4 3.0 GHz (Northwood core)	1	4.725	7600	365	6
Compaq Digital AlphaServer 8400 (575 MHz)	6	4.600	11504	900	6.9
IBM eServer pSeries 640 (375 MHz, 4MB L2)	4	4.53	19000	400	6
IBM RS/6000 44P-270 (375 MHz, 4MB L2)	4	4.53	19000	400	6
IBM RS/6000 44P-270 (4 proc,375 MHz,4 MB L2)	4	4.53	19000	180	6
IBM RS/6000 7026-B80(4 proc,375 MHz,4 MB L2)	4	4.53	19000	400	6
SGI POWER CHALLENGE (195 MHz, 1 MB cache)	16	4.527	15000	2200	6.2
HP AlphaServer GS1280 7/1300 (1.3 GHz)	2	4.52	14142		5.2
Compaq Digital AlphaServer 8200 (575 MHz)	6	4.450	11504	800	6.9
NEC SX-3/31R (2.5 ns)	3	4.4	6144	414	5.4
Sun HPC 6500(400MHz 8MB L2 Cache)	6	4.356	39936	768	4.8
Sun HPC 4500(400MHz 4MB L2 Cache)	6	4.334	20352	960	4.8
SGI POWER CHALLENGE (90 MHz)	16	4.323	2500	540	5.8
Cray C90 (240 MHz)***	3	4.31	13312	380	2.9
Sun Ultra HPC 6000 167 MHz (1MB L2 Cache)	16	4.305	14000	700	5.3
SGI POWER CHALLENGE (75 MHz)	18	4.142	2604	570	5.4
Compaq ES40/EV67 AlphaServer SC (667 MHz)	4	4.111	10000	850	5.34
Cray SV1-1-32 (300 MHz)	4	4.105	15372	1250	4.8
HP Exemplar S-Class SPP-UX 5.2	8	4.103	13320	520	5.8
Alliant CAMPUS/800 (40 MHz)	168	4.1	16016	5516	6.7
SGI POWER CHALLENGE (195 MHz, 1 MB cache)	14	4.041	15000	2000	5.5
SGI Origin 2000 (195 MHz, 4MB cache)	12	4.038	15000	1000	4.7
IBM IntelliStation POWER 275 (1.45GHz POWER4+)	1	4.02	26000	200	5.8
DEC 8400 5/625 (612 MHz)	6	4.003	9156	1100	7.34
Intel Paragon XPS-35 (50 MHz, OS=R1.1)	128	4.0	12000	3000	6.4
hp AlphaServer GS1280 7/1150(1.15 GHz)	2	3.98	7500		4.6
HP AlphaServer ES80 7/1150 (1.15 GHz)	2	3.97	14142		4.6
HP AlphaServer ES47 7/1150 (1.15 GHz)	2	3.97	14142		4.6
Convex SPP-1200(32 procs)120 MHz	32	3.962	27700	4500	7.7
DEC AlphaServer 8400 5/300	10	3.9	9540	812	6.0
Parsytec GC/Power Plus (80 MHz)	96	3.9	19000	6599	7.7
IBM SP2 (160 MHz)	8	3.83	10000	1320	5.1
Thinking Machines CM-5	64	3.8	13056	6016	8
Cray J912 (10 ns) ***	12	3.768	19456	690	2.4
SGI POWER CHALLENGE (90 MHz)	14	3.767	2000	470	5.0
HITACHI SR2201/16(150MHz)	16	3.74	19440	2880	4.8
IBM SP2 (77 MHz, switch of 4/96)	16	3.7	13500	2200	5
SGI POWER CHALLENGE (75 MHz)	16	3.7	2500	540	4.8
IBM eServer pSeries 650 6M2(1.45GHz POWER4+)	1	3.68	24000	200	5.8
Sun HPC 6000(336MHz 4MB L2 Cache)	6	3.672	20352	960	4.0
SGI POWER CHALLENGE (195 MHz, 2MB cache)	12	3.604	10000	2000	4.7
Sun Ultra HPC 6000 250 MHz (4MB L2 Cache)	8	3.589	15552	768	4.0
DEC 4100 5/400 (400 MHz)	8	3.57	8964	1340	6.4

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
CRAY T3E (300 MHz)	8	3.542	10560	1152	4.8
Alliant CAMPUS/800 (40 MHz)	144	3.5	15484	4956	5.8
Intel Delta (40 MHz)	128	3.5	12500	3500	5
SGI POWER CHALLENGE (195 MHz, 1 MB cache)	12	3.496	15000	1650	4.7
IBM eServer pSeries 655 651(1.3GHz POWER4)	1	3.45	24000	200	5.2
IBM SP2 thin-node2,SP-sw,256MB/node(66 MHz)	16	3.414	19000	3400	4.2
SGI POWER CHALLENGE (90 MHz)	12	3.398	2000	450	4.3
Hewlett-Packard N4000 (550 MHz)	2	3.391	28000	276	4.4
CRAY T3E-1200E (600 MHz)	4	3.372	15936	960	4.8
Sun Ultra HPC 6000 250 MHz (1MB L2 Cache)	8	3.328	15700	700	4.0
Cray SV1ex-1-32, 500MHz	2	3.318	11088	600	4.0
Convex SPP-1000(32 procs)100 MHz	32	3.306	25800	4700	6.4
Intel Pentium 4 (2.53 GHz)	1	3.210	9000	340	5.09
SGI POWER CHALLENGE (75 MHz)	14	3.203	2000	470	4.2
Cray T3D 32 (150 MHz)	32	3.2	14592	1616	3.6
DEC AlphaServer 8400 5/300	8	3.2	7668	540	4.8
Sun Ultra 80 (450MHz/4MB L2)	4	3.090	20352	576	3.6
IBM SP2-T2 (66 MHz)	16	3.0	13000	2600	4.2
IBM eServer pSeries 655 651(1.1GHz POWER4)	1	2.93	24000	200	4.4
Cray C90 (240 MHz)***	2	2.92	13312	350	1.9
HP Exemplar V-Class (240 MHz)	4	2.910	14944	400	3.84
Alliant CAMPUS/800 (40 MHz)	120	2.9	14000	4620	4.8
NEC SX-3/12R (2.5 ns)	1	2.9	2048	174	3.2
NEC SX-3/21R (2.5 ns)	2	2.9	2560	257	3.2
Sun HPC 6500(400MHz 8MB L2 Cache)	4	2.898	39936	576	3.2
Sun HPC 4500(400MHz 4MB L2 Cache)	4	2.893	20352	960	3.2
Sun HPC 450 (400 MHz)	4	2.879	20252	960	3.2
IBM POWER2 Super Chip RS/6000 SP(120 MHz)	8	2.876	9500	1500	3.8
SGI POWER CHALLENGE (75 MHz)	12	2.874	2000	450	3.6
Convex SPP-1600(16 procs)120 MHz	16	2.840	18000	2400	3.8
Convex SPP-1200(24 procs)120 MHz	24	2.830	21100	3400	5.8
SGI POWER CHALLENGE (90 MHz)	10	2.830	2000	400	3.6
IBM IntelliStation POWER 275 (1GHz POWER4+)	1	2.82	26000	200	4.0
Meiko CS2	32	2.8	13824	3488	5.8
Parsytec GC/Power Plus (80 MHz)	64	2.8	16000	4500	5.1
HP N4000 (440 MHz)	2	2.761	28000	268	3.5
Sun Ultra HPC 6000 250 MHz (4MB L2 Cache)	6	2.694	15552	672	3.0
SGI Origin 2000 (195 MHz, 4MB cache)	8	2.678	10000	1000	3.1
CRAY T3E-900 (450 MHz)	4	2.630	11040	880	3.6
Intel iPSC/860 (40 MHz)	128	2.6	12000	4500	5.
Cray J908 (10 ns) ***	8	2.585	19456	520	1.6
SGI POWER CHALLENGE (195 MHz, 2MB cache)	8	2.513	10000	1500	3.1
NEC SX-3/12 (2.9 ns)	1	2.5	2048	256	2.8
HP Exemplar V-Class (200 MHz)	4	2.495	14944	384	3.2

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Sun Fire 6800 (750MHz/8MB L2$)	2	2.486	15180		3
Sun Ultra HPC 6000 250 MHz (1MB L2 Cache)	6	2.483	15700	700	3.0
Cray T94 (2.2 ns) ***	1	2.474	8192	280	1.8
Sun HPC 6000(336MHz 4MB L2 Cache)	4	2.452	20352	960	2.7
DEC AlphaServer 8200 5/300	6	2.4	9640	540	3.6
DEC AlphaServer 8400 5/300	6	2.4	9640	540	3.6
IBM SP-1	32	2.4	16000	4000	4
Thinking Machines CM-200 (10 MHz)	512	2.4	14848	5632	5
SGI POWER CHALLENGE (75 MHz)	10	2.395	2000	470	3.0
IBM eServer pSeries 640 (375 MHz, 8MB L2)	2	2.38	12000	200	3
IBM RS/6000 44P-270 (2 proc,375 MHz,8 MB L2)	2	2.38	12000	200	3
IBM RS/6000 44P-270 (375 MHz, 8MB L2)	2	2.38	12000	200	3
SGI POWER CHALLENGE (90 MHz)	8	2.318	1900	360	2.9
Alliant CAMPUS/800 (40 MHz)	96	2.3	13020	4396	3.8
Fujitsu AP1000	512	2.3	25600	2500	2.8
Intel iPSC/860 (40 MHz)	120	2.3	12000	4500	4.8
HP AlphaServer GS1280 7/1300 (1.3 GHz)	1	2.27	10000		2.6
IBM eServer pSeries 640 (375 MHz, 4MB L2)	2	2.27	13000	180	3
IBM RS/6000 44P-270 (2 proc,375 MHz,4 MB L2)	2	2.27	13000	400	3
IBM RS/6000 44P-270 (375 MHz, 4MB L2)	2	2.27	13000	180	3
IBM RS/6000 7026-B80(2 proc,375 MHz,4 MB L2)	2	2.27	13000	180	3
Sun Ultra HPC 6000 167 MHz (1MB L2 Cache)	8	2.185	14000	500	2.7
HP Exemplar S-Class SPP-UX 5.2	4	2.121	13320	520	2.9
Sun Ultra HPC 450 (300 MHz)	4	2.09	10944	492	2.4
Cray SV1-1-32 (300 MHz)	2	2.073	11088	600	2.4
Convex SPP-1200(16 procs)120 MHz	16	2.032	19000	2800	3.8
DEC 4100 5/400 (400 MHz)	4	2.019	4929	1280	3.2
HP AlphaServer ES80 7/1150 (1.15 GHz)	1	2.01	10000		2.3
HP AlphaServer ES47 7/1150 (1.15 GHz)	1	2.01	10000		2.3
hp AlphaServer GS1280 7/1150(1.15 GHz)	1	2.00	5000		2.3
Intel Paragon XPS-35 (50 MHz, OS=R1.1)	64	2.0	8000	2000	3.2
SGI POWER CHALLENGE (75 MHz)	8	1.955	1900	360	2.4
Intel iPSC/860 (40 MHz)	96	1.9	11000	4000	3.8
nCUBE 2 (20 MHz)	1024	1.9	21376	3193	2.4
Thinking Machines CM-5	32	1.9	9216	4096	4
CRAY T3E (300 MHz)	4	1.806	7488	768	2.4
IBM SP2 (77 MHz, switch of 4/96)	8	1.8	9500	1200	2.5
Sun Ultra HPC 6000 250 MHz (4MB L2 Cache)	4	1.798	15552	576	2.0
IBM SP2 thin-node2,SP-sw,256MB/node(66 MHz)	8	1.768	12000	1700	2.1
AMD ATHLON Thunderbird 1.2GHz	1	1.755	3800	295	2.4
Intel Delta (40 MHz)	64	1.7	8000	2500	2.6
SGI POWER CHALLENGE (90 MHz)	6	1.690	2000	294	2.2
CRAY T3E-1200E (600 MHz)	2	1.675	11040	576	2.4
Cray SV1ex-1-32, 500MHz	1	1.671	7452	350	2.0

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Alliant CAMPUS/800 (40 MHz)	72	1.6	12012	3724	2.9
MasPar MP-2216 (80ns)	16384	1.6	11264	1920	2.4
Sun Ultra 80 (450MHz/4MB L2)	2	1.560	20352	384	1.8
Sun Ultra HPC 6000 250 MHz (1MB L2 Cache)	4	1.560	15700	500	2.0
DEC 4100 5/300 (300 MHz)	4	1.544	4436	500	2.4
Sun Fire 6800 (900MHz/8MB L2)	1	1.509	28956	600	1.8
IBM SP2-T2 (66 MHz)	8	1.5	9000	1680	2.1
Meiko CS2	16	1.5	10880	1952	2.9
NEC SX-3/11R (2.5 ns)	1	1.5	2048	130	1.6
Parsytec GC/Power Plus (80 MHz)	32	1.5	11000	3500	2.5
Convex SPP-1600(8 procs)120 MHz	8	1.455	11000	750	1.9
Sun HPC 450 (400 MHz)	2	1.455	20252	960	1.6
SGI POWER CHALLENGE (75 MHz)	6	1.430	2000	294	1.8
Intel iPSC/860 (40 MHz)	72	1.4	9000	3500	2.9
Intel iPSC/860 (40 MHz)	64	1.4	9000	3500	2.6
SGI Origin 2000 (195 MHz, 4MB cache)	4	1.385	10000	1000	1.6
CRAY T3E-900 (450 MHz)	2	1.323	7776	528	1.8
SGI POWER CHALLENGE (195 MHz, 2MB cache)	4	1.305	10000	1000	1.6
Meiko Computing Surface (40 MHz)	62	1.3	8500	3500	2.5
NEC SX-3/11 (2.9 ns)	1	1.3	2816	192	1.4
SGI CHALLENGE (6.6ns)	36	1.284	8000	2000	2.7
Sun Fire 6800 (750MHz/8MB L2$)	1	1.260	15180		1.5
SGI CHALLENGE (6.6ns)	32	1.254	8000	2000	2.4
DEC AlphaServer 2100 5/250	4	1.2	4056	800	2.0
Fujitsu AP1000	256	1.2	18000	1600	1.4
IBM SP-1	16	1.2	12000	2300	2
Thinking Machines CM-200 (10 MHz)	256	1.2	10752	4096	2.5
SGI POWER CHALLENGE (90 MHz)	4	1.182	1000	240	1.4
SGI CHALLENGE (6.6ns)	28	1.153	8000	2000	2.1
Alliant CAMPUS/800 (40 MHz)	48	1.1	10024	3024	1.9
Sun Ultra HPC 450 (300 MHz)	2	1.05	10944	192	1.2
SGI POWER CHALLENGE (75 MHz)	4	1.046	14000	1000	1.2
Cray SV1-1-32 (300 MHz)	1	1.044	7452	350 1.2	
Convex SPP-1200(8 procs)120 MHz	8	1.026	11000	750	1.9
SGI CHALLENGE/Onyx (6.6ns)	24	1.014	8000	1000	1.8
Sun HPC 2 (300 MHz)	2	1.01	7104	288	1.2
Convex SPP-1000(8 procs)100 MHz	8	1.005	11000	550	1.6
SGI POWER CHALLENGE (75 MHz)	4	.993	1000	240	1.2
Intel iPSC/860 (40 MHz)	48	.98	7000	3000	1.9
Thinking Machines CM-5	16	.98	6528	3008	2
nCUBE 2 (20 MHz)	512	.958	15200	2240	1.2
HITACHI SR2201/4(150MHz)	4	.941	9720	1200	1.2
IBM PVS (40MHz)	32	.925	6000	1560	1.3
Intel Delta (40 MHz)	32	.9	6000	2000	1.3

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
CRAY T3E (300 MHz)	2	0.896	5280	384	1.2
SGI CHALLENGE/Onyx (6.6ns)	20	.866	7000	1000	1.5
Meiko Computing Surface (40 MHz)	32	.825	7000	3000	1.3
Meiko CS2	8	.8	8064	1088	1.4
SGI CHALLENGE/Onyx (6.6ns)	18	.796	8000	1000	1.35
Sun Ultra 80 (450MHz/4MB L2)	1	.781	20352	192	.9
NEC SX-3/1LR (2.5 ns)	1	.78	2304	112	0.8
Sun HPC 450 (400 MHz)	1	0.729	20252	960	0.8
SGI CHALLENGE/Onyx (6.6ns)	16	.702	8000	1000	1.2
SGI Origin 2000 (195 MHz, 4MB cache)	2	.699	10000	600	.78
IBM RS/6000 Cluster (PARC) (62.5 MHz)	8	.694	10000	1500	1.0
Parsytec GC/Power Plus (80 MHz)	16	.68	7700	2200	1.3
NEC SX-3/1L (2.9 ns)	1	.67	2048	128	.68
SGI POWER CHALLENGE (195 MHz, 2MB cache)	2	.663	10000	600	.78
Intel iPSC/860 (40 MHz)	32	.64	6000	2500	1.3
SGI CHALLENGE/Onyx (6.6ns)	14	.631	8000	1000	1.05
SGI POWER CHALLENGE (90 MHz)	2	.601	1000	180	.72
Fujitsu AP1000	128	.566	12800	1100	.71
SGI CHALLENGE/Onyx (6.6ns)	12	.554	7000	1000	.9
IBM RS/6000 Cluster (PARC) (50 MHz)	8	.520	7500	1300	.8
Sun Ultra HPC 450 (300 MHz)	1	.52	10944	192	.6
SGI POWER CHALLENGE (75 MHz)	2	.505	1000	180	.6
Alliant CAMPUS/800 (40 MHz)	24	.504	7000	2492	.96
Sun HPC 2 (300 MHz)	1	.50	7104	288	.6
Intel iPSC/860 (40 MHz)	24	.49	5000	2000	.96
nCUBE 2 (20 MHz)	256	.482	10784	1504	.64
MasPar MP-1216 (80ns)	16384	.473	11264	1280	.55
SGI CHALLENGE/Onyx (6.6ns)	10	.472	8000	1000	.75
Intel Delta (40 MHz)	16	.45	4000	1000	.64
Meiko Computing Surface (40 MHz)	16	.445	5000	2000	.64
MasPar MP-1 (80 ns)	16384	.44	5504	1180	.58
IBM RS/6000 Cluster (PARC) (50 MHz)	6	.404	7000	1200	.6
ALR Revolution Quad 6 (4 Pentium 200 MHz)	4	.403	2750	530	.8
MasPar MP-2204 (80ns)	4096	.374	5632	896	.60
IBM RS/6000 Cluster (PARC) (62.5 MHz)	4	.37	5500	850	.50
Intel iPSC/860 (40 MHz)	16	.36	4500	1500	.64
SGI Origin 2000 (195 MHz, 4MB cache)	1	.356	10000	200	.39
SGI POWER CHALLENGE (195 MHz, 2MB cache)	1	.334	10000	200	.39
SGI POWER CHALLENGE (90 MHz)	1	.311	1000	100	.36
IBM RS/6000 Cluster (PARC) (50 MHz)	4	.293	5500	1000	.4
Fujitsu AP1000	64	.291	10000	648	.36
SGI POWER CHALLENGE (75 MHz)	1	.261	1000	100	.3
nCUBE 2 (20 MHz)	128	.242	7776	1050	.32
HITACHI SR2201/1(150MHz)	1	.237	4860	420	.3
Meiko Computing Surface (40 MHz)	8	.235	3500	750	.32

Computer (Full Precision)	Number of Procs or Cores	R_{max} GFlop/s	N_{max} Order	$N_{1/2}$ Order	R_{Peak} GFlop/s
Parsytec FT-400 (20 MHz)	400	.232	7999	814	.6
Intel Delta (40 MHz)	8	.23	3000	1000	.32
Intel iPSC/860 (40 MHz)	8	.19	3000	850	.32
Meiko Computing Surface (40 MHz)	4	.121	2500	500	.16
nCUBE 2 (20 MHz)	64	.121	5472	701	.15
Intel Delta (40 MHz)	4	.12	2000	500	.16
MasPar MP-1204 (80ns)	4096	.116	5632	640	.138
Intel iPSC/860 (40 MHz)	4	.10	2250	550	.16
IBM RS/6000 (62.5 MHz)	1	.096	3000		.125
MasPar MP-2201 (80ns)	1024	.092	2816	448	.15
Thinking Machines CM-5	1	.068	1632	672	.128
Meiko Computing Surface (40 MHz)	2	.062	1750	250	.08
nCUBE 2 (20 MHz)	32	.061	3888	486	.075
Intel Delta (40 MHz)	2	.06	1500	500	.08
Intel iPSC/860 (40 MHz)	2	.058	1500	400	.08
nCUBE 2 (20 MHz)	16	.032	5580	342	.038
Meiko Computing Surface (40 MHz)	1	.031	1250		.04
MasPar MP-1201 (80ns)	1024	.029	2816	320	.034
Intel iPSC/860 (40 MHz)	1	.024	750		.040
nCUBE 2 (20 MHz)	8	.0161	3960	241	.019
nCUBE 2 (20 MHz)	4	.0080	2760	143	.0094
nCUBE 2 (20 MHz)	2	.0040	1280	94	.0047
nCUBE 2 (20 MHz)	1	.0020	1280	51	.0024

* The Numerical Wind Tunnel is not a commercial product; it is a computer of the National Aerospace Laboratory in Japan and is based on the Fujitsu vector processor board.
The CP-PACS (Computational Physics by Parallel Array Computer System) is not a commercial product, it is a computer of the University of Tsukuba, Japan. Hitachi modified several points in their SR-2201 computer. The processor, manufactured by Hitachi, is a custom superscalar processor. It is based on the PA-RISC Architecture enhanced with a PVP-SW (pseudo vector processor based on slide window registers) scheme.

** The IBM GF11 is an experimental research computer and not a commercial product.

*** Indicates Strassen Algorithm was used in computing the solution. Note the "achieved rate" is large than the "peak rate" for the computer. The rate of execution for this problem is based on the number of floating point operations divided by the time to solve the problem. The floating point operation count $2/3n^3 + O(n^2)$ is based on a conventional Gaussian Elimination implementation. Strassen's Algorithm reduced the number of operations actually performed. The results obtained for the computation presented here using Strassen Algorithm are as accurate as that from Gaussian Elimination. In general however Strassen's algorithm has less favorable stability properties than conventional matrix multiplication.

**** The Earth Simulator is not a commercial product; it is a computer of the Earth Simulator Center, the arm of the Japan Marine Science and Technology Center. It is based on vector processors that are manufactured by NEC.

The columns in Table 3 are defined as follows:

- R_{max} the performance in Gflop/s for the largest problem run on a machine.
- N_{max} the size of the largest problem run on a machine.
- $N_{1/2}$ the size where half the R_{max} execution rate is achieved.

- R_{peak} the theoretical peak performance in Gflop/s for the machine.

In addition, the number of processors and the cycle time is listed. Full or half precision reflects the computation was computed using 64 or 32-bit floating point arithmetic respectively.

***** The algorithm used in obtaining this performance is based on an iterative refinement approach where both 32 and 64 bit floating point arithmetic is used. The method performs a LU factorization in 32 bit arithmetic and uses an iterative refinement approach which selectively uses 64 bit arithmetic to improve the solution to full 64 bit accuracy. The accuracy obtained is equivalent to the 64 bit implementation. In this case the R_{peak} is quoted for both the peak rates for 32 and 64 bit floating point arithmetic. A negative aspect of this approach is that the method need 1.5 times the memory of the approach used in the normal 64 bit implementation of LU factorization. See http://icl.cs.utk.edu/iter-ref/ for additional details.

3. *Acknowledgments*

I am indebted to the many people who have helped put together this collection.

References

1. J. Dongarra, J. Bunch, C. Moler, and G. W. Stewart. *LINPACK User's Guide*. SIAM, Philadelphia, PA, 1979.

2. J. J. Dongarra, I. S. Duff, D. C. Sorensen, and H. A. Van der Vorst. *Solving Linear Systems on Vector and Shared Memory Computers*. SIAM Publications, Philadelphia, PA, 1990.

3. C. Lawson, R. Hanson, D. Kincaid, and F. Krogh. Basic linear algebra subprograms for Fortran usage. *ACM Trans. Math. Softw.*, 5:308–323, 1979.