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# Performance of Various Computers Using Standard Linear Equations Software

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An up-to-date version of this report can be found at http://www.netlib.org/benchmark/performance.ps
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## 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 $\varepsilon$ 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 $\varepsilon$ 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

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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) | | | | |