# SPEC® CFP2006 Result

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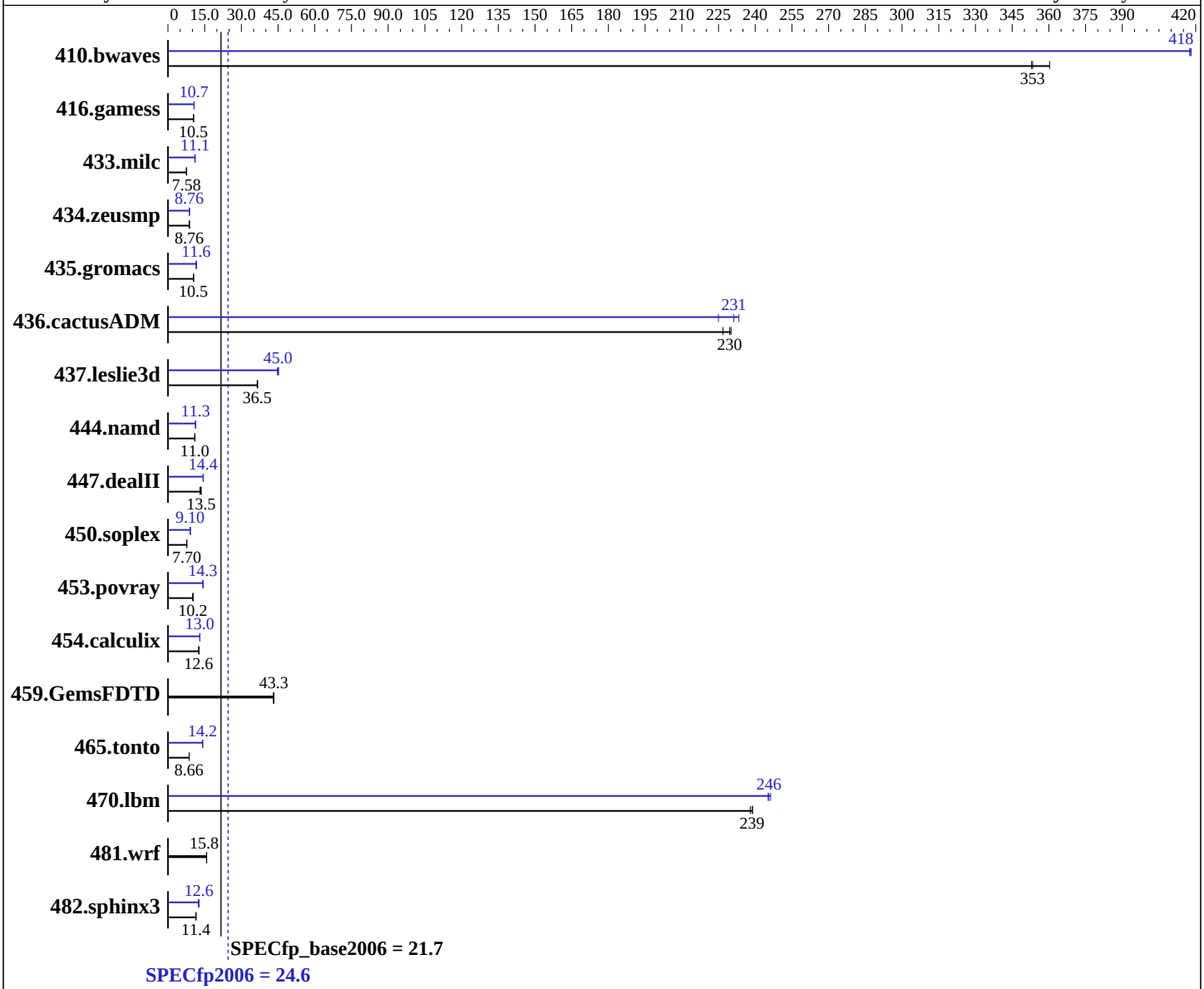
## Sun Microsystems
## Sun SPARC Enterprise M8000

SPECfp®2006 = 24.6

SPECfp_base2006 = 21.7

**CPU2006 license:** 6
**Test sponsor:** Sun Microsystems
**Tested by:** Sun Microsystems

**Test date:** Feb-2008
**Hardware Availability:** Apr-2007
**Software Availability:** May-2008




## Hardware

| | |
|---|---|
| CPU Name: | SPARC64 VI |
| CPU Characteristics: | |
| CPU MHz: | 2400 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 16 chips, 2 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1 to 4 CMUs; each CMU contains 2 or 4 chips |
| Primary Cache: | 128 KB I + 128 KB D on chip per core |
| Secondary Cache: | 6 MB I+D on chip per chip |

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## Software

| | |
|---|---|
| Operating System: | Solaris 10 5/08 s10s_u5wos_08 |
| Compiler: | Sun Studio 12, Patch 124867-02 (see patch info below) |
| Auto Parallel: | Yes |
| File System: | ufs |
| System State: | Default |
| Base Pointers: | 32-bit |
| Peak Pointers: | 32-bit |

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L3 Cache: None
Other Cache: None
Memory: 256 GB (128 x 2 GB DIMMs)
Disk Subsystem: 408 GB SVM RAID 1+0 on 12 x 73 GB 10,000 RPM Fujitsu MAY2073RC SAS
Other Hardware: None

Other Software: None

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 38.5 | 353 | 37.7 | 360 | **38.5** | **353** | **32.5** | **418** | 32.5 | 418 | 32.5 | 418 |
| 416.gamess | 1874 | 10.4 | **1873** | **10.5** | 1872 | 10.5 | 1833 | 10.7 | 1833 | 10.7 | **1833** | **10.7** |
| 433.milc | 1205 | 7.62 | 1215 | 7.56 | **1211** | **7.58** | 826 | 11.1 | **826** | **11.1** | 836 | 11.0 |
| 434.zeusmp | **1039** | **8.76** | 1039 | 8.76 | 1039 | 8.76 | 1039 | 8.76 | **1039** | **8.76** | 1040 | 8.75 |
| 435.gromacs | 684 | 10.4 | 683 | 10.5 | **683** | **10.5** | 619 | 11.5 | 615 | 11.6 | **616** | **11.6** |
| 436.cactusADM | 52.7 | 227 | 51.9 | 230 | **52.1** | **230** | 53.1 | 225 | 51.2 | 233 | **51.7** | **231** |
| 437.leslie3d | **257** | **36.5** | 256 | 36.7 | 258 | 36.5 | 210 | 44.8 | 208 | 45.2 | **209** | **45.0** |
| 444.namd | **729** | **11.0** | 729 | 11.0 | 730 | 11.0 | 710 | 11.3 | 710 | 11.3 | **710** | **11.3** |
| 447.dealII | **845** | **13.5** | 844 | 13.5 | 875 | 13.1 | **793** | **14.4** | 798 | 14.3 | 793 | 14.4 |
| 450.soplex | **1084** | **7.70** | 1083 | 7.70 | 1084 | 7.69 | 910 | 9.17 | 917 | 9.09 | **916** | **9.10** |
| 453.povray | 523 | 10.2 | 519 | 10.3 | **521** | **10.2** | 370 | 14.4 | **372** | **14.3** | 373 | 14.3 |
| 454.calculix | 653 | 12.6 | **654** | **12.6** | 654 | 12.6 | 634 | 13.0 | **633** | **13.0** | 632 | 13.1 |
| 459.GemsFDTD | 246 | 43.1 | 245 | 43.3 | **245** | **43.3** | 246 | 43.1 | 245 | 43.3 | **245** | **43.3** |
| 465.tonto | 1134 | 8.68 | 1138 | 8.64 | **1136** | **8.66** | **693** | **14.2** | 693 | 14.2 | 696 | 14.1 |
| 470.lbm | 57.7 | 238 | **57.5** | **239** | 57.5 | 239 | 56.0 | 245 | 55.8 | 246 | **55.9** | **246** |
| 481.wrf | **707** | **15.8** | 708 | 15.8 | 705 | 15.8 | **707** | **15.8** | 708 | 15.8 | 705 | 15.8 |
| 482.sphinx3 | 1704 | 11.4 | 1700 | 11.5 | **1703** | **11.4** | 1539 | 12.7 | **1541** | **12.6** | 1565 | 12.5 |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Compiler Invocation Notes

```
Sun Studio compiler patches are available at
http://developers.sun.com/sunstudio/downloads/patches/ss12_patches.jsp
The tested configuration included patch 124867-02, 124861-04,
124863-02, and 127000-02
```

## Operating System Notes

```
Stack size set to unlimited via "ulimit -s unlimited"

Program threads were bound to processors with:
```

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## Operating System Notes (Continued)

```
    SUNW_MP_PROCBIND="1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
                      39 41 43 45 47 49 51 53 55 57 59 61 63"

Behavior of parallel threads was set with:
    SUNW_MP_THR_IDLE=SPIN
SPIN specifies that an idle thread should spin while waiting at barrier
or waiting for new parallel regions to work on.

The maximum number of threads a program can create was set with:
    OMP_NUM_THREADS=32


 System Tunables:
 (/etc/system parameters)
    maxphys=4194304
       Defines the maximum size of I/O requests, in bytes.
    maxpgio=1024
       Defines the maximum number of page I/O requests that can
       be queued by the paging system.
    tune_t_fsflushr=4
       Controls how many seconds elapse between runs of the
       page flush daemon, fsflush.
    autoup=60
       Causes pages older than the listed number of seconds to
       be written by fsflush.
    bufhwm=3000
       Memory byte limit for caching I/O buffers
    segmap_percent=1
       Set maximum percent memory for file system cache
```

## Platform Notes

```
 This result is measured on a Sun SPARC Enterprise
 M8000 Server.  Note that the Sun SPARC Enterprise
 M8000 and Fujitsu SPARC Enterprise M8000 are electrically
 equivalent.

 Memory is 8-way interleaved by filling all slots with
 the same capacity DIMMs.
```

# Base Compiler Invocation

C benchmarks:
```
    cc
```

C++ benchmarks:
```
    CC
```

Continued on next page

## Base Compiler Invocation (Continued)

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

## Base Optimization Flags

C benchmarks:
-fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2 -xautopar
-xreduction -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access

C++ benchmarks:
-library=stlport4 -fast -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xautopar -xreduction -xprefetch_level=2
-xalias_level=compatible

Fortran benchmarks:
-fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2 -xautopar
-xreduction -xprefetch_level=2

Benchmarks using both Fortran and C:
-fast(cc) -fast(f90) -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xautopar -xreduction -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access -xprefetch_level=2

## Base Other Flags

C benchmarks:
-xjobs=64

C++ benchmarks:
-xjobs=64

Fortran benchmarks:
-xjobs=64

Benchmarks using both Fortran and C:
-xjobs=64

## Peak Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

## Peak Optimization Flags

C benchmarks:

433.milc: -fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2
-xalias_level=std -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access
-xalias_level=strong -xprefetch_level=2

470.lbm: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
-xpagesize=4M -xprefetch=latx:2 -xalias_level=std
-xprefetch_level=3 -xprefetch_auto_type=indirect_array_access
-xarch=v8plusb -xprefetch_level=2 -xautopar -xreduction

482.sphinx3: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
-xalias_level=std

C++ benchmarks:

444.namd: -library=stlport4 -fast -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xalias_level=compatible -xdepend

447.dealII: -library=stlport4 -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
-xalias_level=compatible -xdepend -xrestrict
-xprefetch=latx:4.5

450.soplex: -library=stlport4 -fast -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xdepend -xprefetch_level=2
-xprefetch_auto_type=indirect_array_access
-Qoption cg -Qlp-ol=1 -Qoption cg -Qlp-it=3
-Qoption cg -Qlp-imb=1 -Qoption iropt -Apf:pdl=3

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## Peak Optimization Flags (Continued)

453.povray: -library=stlport4 -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
-xpagesize=4M -xprefetch=latx:2 -xalias_level=compatible
-xdepend -xrestrict -xprefetch=latx:4.5

Fortran benchmarks:

410.bwaves: -fast -xipo=2 -fma=fused -xpagesize=512K -xprefetch=latx:2
-xprefetch_level=2 -xautopar -xreduction

416.gamess: -fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2
-xprefetch_level=2

434.zeusmp: -fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2
-xautopar -xreduction

437.leslie3d: -fast -xipo=2 -xautopar -xreduction -fma=fused
-xprefetch_level=2 -xprefetch=latx:8.0

459.GemsFDTD: basepeak = yes

465.tonto: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
-xpagesize=4M -xprefetch=latx:2 -xarch=v8plusa
-xprefetch=latx:12 -lfast

Benchmarks using both Fortran and C:

435.gromacs: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xipo=2 -fma=fused -xalias_level=std

436.cactusADM: -fast(cc) -fast(f90) -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xalias_level=std -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access -xautopar
-xreduction

454.calculix: -fast(cc) -fast(f90) -xipo=2 -fma=fused -xalias_level=std

481.wrf: basepeak = yes

## Peak Other Flags

C benchmarks:
-xjobs=64

C++ benchmarks:
-xjobs=64

Continued on next page

## Peak Other Flags (Continued)

Fortran benchmarks:
`-xjobs=64`

Benchmarks using both Fortran and C:
`-xjobs=64`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-and-gccfss4.2.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-and-gccfss4.2.xml`


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Tested with SPEC CPU2006 v1.0.1.
Report generated on Tue Jul 22 15:26:21 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 19 March 2008.