# SPEC® CFP2006 Result



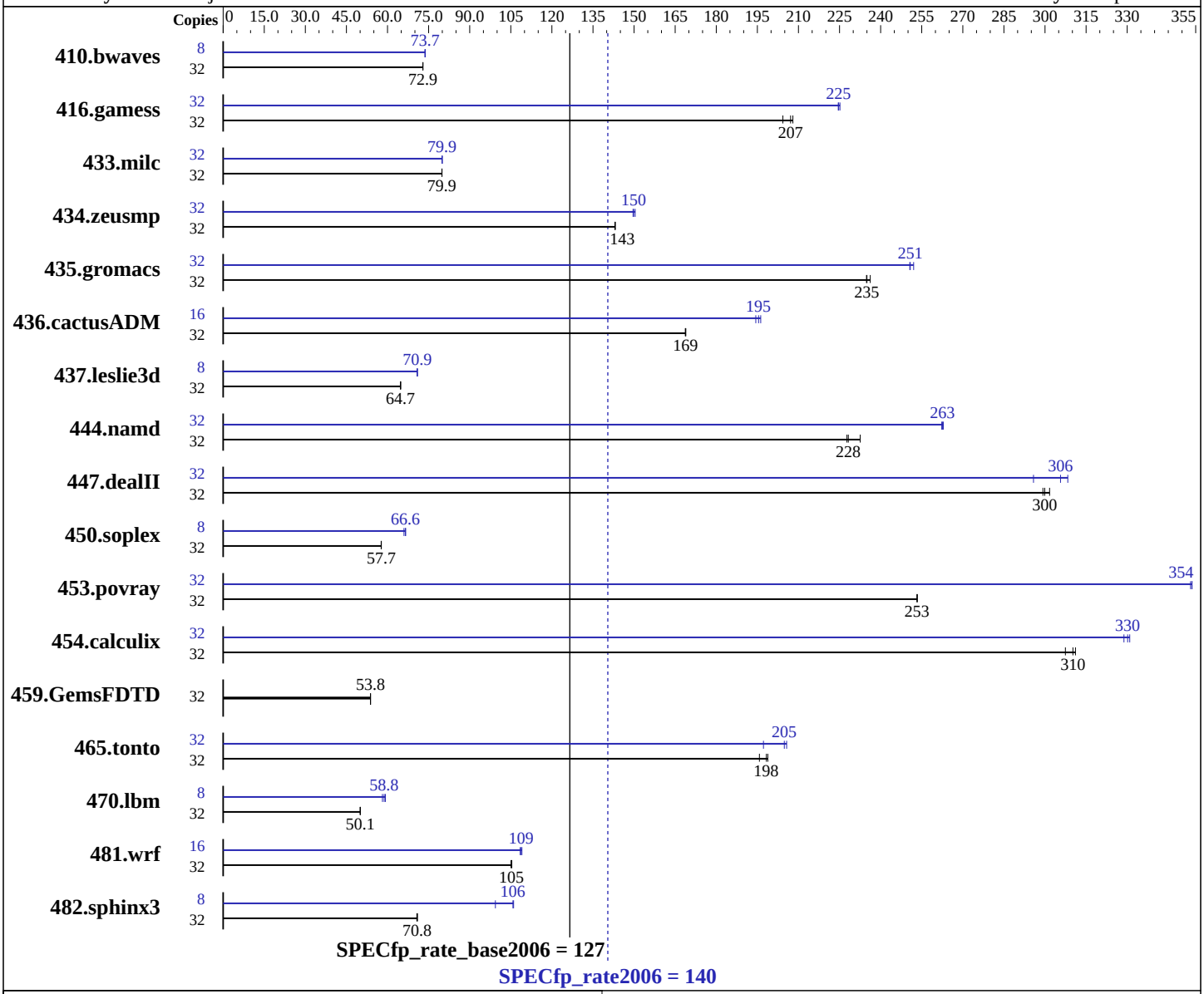
## Oracle Corporation
## SPARC Enterprise M4000

**SPECfp®_rate2006 = 140**

**SPECfp_rate_base2006 = 127**

**CPU2006 license:** 6
**Test sponsor:** Oracle Corporation
**Tested by:** Fujitsu

**Test date:** Oct-2010
**Hardware Availability:** Dec-2010
**Software Availability:** Sep-2010




## Hardware

| | |
|---|---|
| CPU Name: | SPARC64 VII+ |
| CPU Characteristics: | |
| CPU MHz: | 2660 |
| FPU: | Integrated |
| CPU(s) enabled: | 16 cores, 4 chips, 4 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1 to 2 CPUMs; each CPUM contains 2 CPU chips |
| Primary Cache: | 64 KB I + 64 KB D on chip per core |
| Secondary Cache: | 11 MB I+D on chip per chip |

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## Software

| | |
|---|---|
| Operating System: | Oracle Solaris 10 9/10 |
| Compiler: | Oracle Solaris Studio 12.2 |
| Auto Parallel: | No |
| File System: | ufs |
| System State: | Default |
| Base Pointers: | 32-bit |
| Peak Pointers: | 32-bit |
| Other Software: | None |

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L3 Cache: None
Other Cache: None
Memory: 128 GB (32 x 4 GB, 8-way interleaved)
Disk Subsystem: 1 x 300 GB 10,000 RPM SAS
Other Hardware: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 32 | 5965 | 72.9 | 5964 | 72.9 | **5965** | **72.9** | 8 | **1474** | **73.7** | 1476 | 73.7 | 1473 | 73.8 |
| 416.gamess | 32 | 3013 | 208 | **3025** | **207** | 3067 | 204 | 32 | 2790 | 225 | **2789** | **225** | 2783 | 225 |
| 433.milc | 32 | 3679 | 79.8 | 3677 | 79.9 | **3679** | **79.9** | 32 | 3675 | 79.9 | 3674 | 80.0 | **3675** | **79.9** |
| 434.zeusmp | 32 | 2035 | 143 | **2035** | **143** | 2036 | 143 | 32 | 1936 | 150 | 1946 | 150 | **1943** | **150** |
| 435.gromacs | 32 | **972** | **235** | 967 | 236 | 973 | 235 | 32 | 906 | 252 | 912 | 251 | **911** | **251** |
| 436.cactusADM | 32 | **2265** | **169** | 2267 | 169 | 2265 | 169 | 16 | **978** | **195** | 983 | 194 | 974 | 196 |
| 437.leslie3d | 32 | 4640 | 64.8 | **4647** | **64.7** | 4649 | 64.7 | 8 | **1061** | **70.9** | 1060 | 70.9 | 1062 | 70.8 |
| 444.namd | 32 | 1127 | 228 | **1125** | **228** | 1104 | 233 | 32 | 976 | 263 | **978** | **263** | 978 | 262 |
| 447.dealII | 32 | **1221** | **300** | 1223 | 299 | 1214 | 302 | 32 | **1198** | **306** | 1238 | 296 | 1187 | 308 |
| 450.soplex | 32 | **4625** | **57.7** | 4622 | 57.7 | 4627 | 57.7 | 8 | 1011 | 66.0 | **1002** | **66.6** | 1002 | 66.6 |
| 453.povray | 32 | 672 | 253 | **672** | **253** | 672 | 253 | 32 | **481** | **354** | 481 | 354 | 482 | 353 |
| 454.calculix | 32 | 859 | 307 | **851** | **310** | 849 | 311 | 32 | 803 | 329 | 798 | 331 | **800** | **330** |
| 459.GemsFDTD | 32 | **6312** | **53.8** | 6314 | 53.8 | 6312 | 53.8 | 32 | **6312** | **53.8** | 6314 | 53.8 | 6312 | 53.8 |
| 465.tonto | 32 | 1609 | 196 | 1584 | 199 | **1588** | **198** | 32 | 1531 | 206 | **1537** | **205** | 1597 | 197 |
| 470.lbm | 32 | 8786 | 50.0 | 8784 | 50.1 | **8784** | **50.1** | 8 | **1870** | **58.8** | 1890 | 58.1 | 1856 | 59.2 |
| 481.wrf | 32 | 3392 | 105 | 3402 | 105 | **3396** | **105** | 16 | 1648 | 108 | 1639 | 109 | **1643** | **109** |
| 482.sphinx3 | 32 | 8821 | 70.7 | 8795 | 70.9 | **8805** | **70.8** | 8 | **1474** | **106** | 1471 | 106 | 1569 | 99.4 |

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

## Compiler Invocation Notes

```
Oracle Solaris Studio 12.2 is distributed with mandatory OS patches
 118683-05  119963-20  120753-08
Oracle Solaris Studio 12.2 and patches are available at
 http://oracle.com/goto/solarisstudio

The Apache C++ Standard Library V4.2.1 was installed from
   http://stdcxx.apache.org/download.html using:
     alias gmake=specmake
     gmake BUILDTYPE=8d CONFIG=sunpro.config
```

## Submit Notes

```
Processes were assigned to specific processors using 'pbind'
commands.  The config file option 'submit' was used, along
with a list of processors in the 'BIND' variable, to generate
the pbind commands.  (For details, please see the config file.)
```

## Operating System Notes

```
ulimit -s 131072 was used to allow the stack to grow
up to 131072 KB (aka 128 MB).  Note that saying "131072"
is preferable to "unlimited", because there is a tradeoff
between space for the stack vs. space for the heap.


System Tunables (/etc/system parameters):

tune_t_fsflushr=10
    Controls how many seconds elapse between runs of the
    page flush daemon, fsflush.
autoup=600
    Causes pages older than the listed number of seconds to
    be written by fsflush.

Other System Settings:

The webconsole service was turned off using
    svcadm disable webconsole
```

## Platform Notes

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

This result is measured on a SPARC Enterprise M4000 server from
Fujitsu.  The SPARC Enterprise M4000 server from Oracle and from
Fujitsu are electrically equivalent.
```

## General Notes

```
447.dealII (peak): "apache_stdcxx_4_2_1" src.alt was used.

447.dealII (base): "apache_stdcxx_4_2_1" src.alt was used.
```

## Base Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

## Base Optimization Flags

C benchmarks:
-fast -fma=fused -xipo=2 -xpagesize=4M -xlinkopt -xvector
-xalias_level=std -xprefetch_auto_type=indirect_array_access
-xprefetch_level=3

C++ benchmarks:
-xdepend -fast -fma=fused -xipo=2 -xpagesize=4M -xlinkopt -xvector
-xalias_level=compatible -xprefetch=latx:0.5 -library=no%Cstd
-I/mnt/spec//stdcxx-4.2.1/include
-I/mnt/spec//stdcxx-4.2.1/build/include
-L/mnt/spec//stdcxx-4.2.1/build/lib -R/mnt/spec//stdcxx-4.2.1/build/lib
-lstd8d

Fortran benchmarks:
-fast -fma=fused -xipo=2 -xpagesize=4M -xlinkopt -xvector
-xprefetch_level=2

Benchmarks using both Fortran and C:
-fast(cc) -fast(f90) -fma=fused -xipo=2 -xpagesize=4M -xlinkopt
-xvector -xalias_level=std -xprefetch_auto_type=indirect_array_access
-xprefetch_level=3 -xprefetch_level=2

## Base Other Flags

C benchmarks:
-xjobs=32 -V -#

C++ benchmarks:
-xjobs=32 -verbose=diags,version

Fortran benchmarks:
-xjobs=32 -V -v

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## Base Other Flags (Continued)

Benchmarks using both Fortran and C:
`-xjobs=32 -V -# -v`

## 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: `-xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-fma=fused -xipo=2 -xarch=generic -fsimple=1`
`-W2,-Ainline:rs=400 -xalias_level=std`
`-xprefetch_auto_type=indirect_array_access -xprefetch_level=2`

470.lbm: `-fast -xpagesize=4M -fma=fused -xipo=2 -xarch=generic`
`-xvector -xunroll=8 -xprefetch=latx:2`

482.sphinx3: `-fast -xpagesize=4M -fma=fused -xalias_level=std`
`-M /usr/lib/ld/map.bssalign -xipo=2 -xprefetch_level=2`
`-xunroll=4 -xprefetch=latx:1.2 -ll2amm`

C++ benchmarks:

444.namd: `-xdepend -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-fma=fused -xalias_level=compatible -library=stlport4`
`-xalias_level=any -xchip=generic -xunroll=2`

447.dealII: `-xdepend -fast -xpagesize=4M -fma=fused`
`-xalias_level=compatible -library=no%Cstd`
`-I/mnt/spec//stdcxx-4.2.1/include`
`-I/mnt/spec//stdcxx-4.2.1/build/include -xipo=2`
`-xprefetch=latx:0.5 -L/mnt/spec//stdcxx-4.2.1/build/lib`
`-R/mnt/spec//stdcxx-4.2.1/build/lib -lstd8d`

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## Peak Optimization Flags (Continued)

450.soplex: -xdepend -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2
-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
-xalias_level=simple -xrestrict -library=stlport4

453.povray: -xdepend -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-fma=fused -xalias_level=compatible -library=stlport4 -xO4
-xipo=2 -xprefetch=no%auto -xunroll=4 -xlinkopt=2 -lfast

Fortran benchmarks:

410.bwaves: -fast -xpagesize=4M -fma=fused -xipo=2 -xprefetch_level=2

416.gamess: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-fma=fused -xipo=2 -xprefetch=no%auto -xO3

434.zeusmp: -fast -xpagesize=4M -fma=fused -xipo=2 -xprefetch=no%auto
-xunroll=3 -ll2amm

437.leslie3d: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-fma=fused -M /usr/lib/ld/map.bssalign -xipo=2
-xprefetch_level=1 -xunroll=7 -ll2amm

459.GemsFDTD: basepeak = yes

465.tonto: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-fma=fused -xipo=2 -xprefetch=no%auto -xO4 -xunroll=3
-lfast

Benchmarks using both Fortran and C:

435.gromacs: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -fma=fused -xipo=2 -xprefetch=no%auto
-xchip=generic -xinline= -fsimple=0 -xunroll=3

436.cactusADM: -fast(cc) -fast(f90) -xpagesize=4M -fma=fused -xipo=2
-xprefetch=latx:0.7 -fsimple=1

454.calculix: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -fma=fused -xipo=2 -xvector -xunroll=8
-xprefetch=latx:3 -xalias_level=std

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## Peak Optimization Flags (Continued)

481.wrf: `-fast`(cc) `-fast`(f90) `-xpagesize=4M -fma=fused -xalias_level=std -xipo=2 -xcache=generic -xunroll=5 -xprefetch=latx:2`

## Peak Other Flags

C benchmarks:
`-xjobs=32 -V -#`

C++ benchmarks:
`-xjobs=32 -verbose=diags,version`

Fortran benchmarks:
`-xjobs=32 -V -v`

Benchmarks using both Fortran and C:
`-xjobs=32 -V -# -v`

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.2-SPARC.20101221.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.2-SPARC.20101221.xml



For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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