# SPEC® CFP2006 Result

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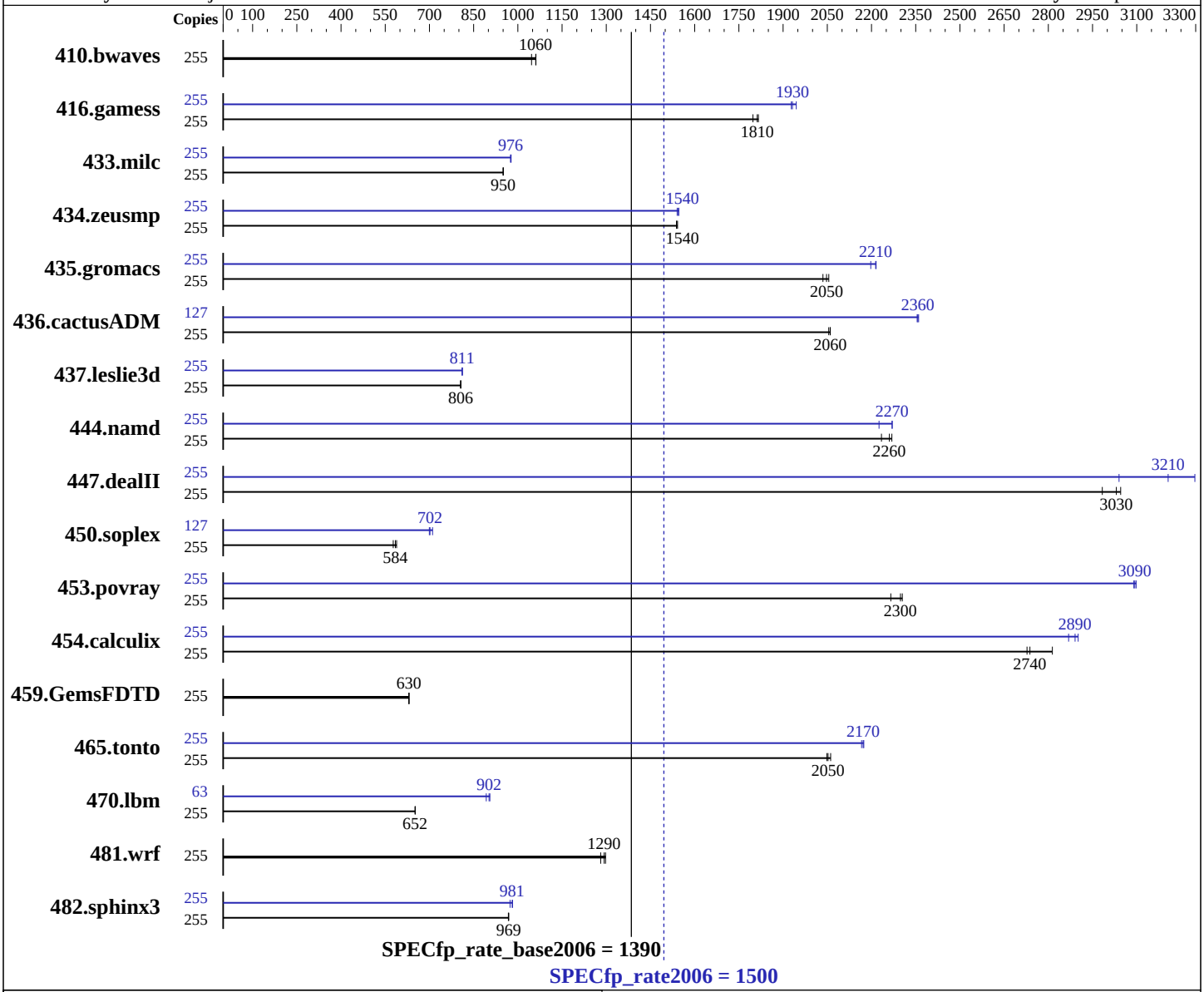
## Oracle Corporation
## SPARC Enterprise M9000

**SPECfp®_rate2006 = 1500**

**SPECfp_rate_base2006 = 1390**

**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: | 3000 |
| FPU: | Integrated |
| CPU(s) enabled: | 128 cores, 32 chips, 4 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1 to 8 CMUs; each CMU contains 2 or 4 CPU chips |
| Primary Cache: | 64 KB I + 64 KB D on chip per core |
| Secondary Cache: | 12 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: | zfs |
| 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: 976 GB (32 x 2 GB + 228 x 4 GB, 8-way interleaved)
Disk Subsystem: 6 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 | 255 | **3267** | **1060** | 3312 | 1050 | 3265 | 1060 | 255 | **3267** | **1060** | 3312 | 1050 | 3265 | 1060 |
| 416.gamess | 255 | 2749 | 1820 | **2755** | **1810** | 2777 | 1800 | 255 | 2567 | 1940 | 2590 | 1930 | **2585** | **1930** |
| 433.milc | 255 | 2463 | 951 | **2463** | **950** | 2464 | 950 | 255 | **2399** | **976** | 2400 | 975 | 2396 | 977 |
| 434.zeusmp | 255 | 1505 | 1540 | **1508** | **1540** | 1509 | 1540 | 255 | 1506 | 1540 | 1501 | 1550 | **1502** | **1540** |
| 435.gromacs | 255 | 895 | 2040 | **889** | **2050** | 886 | 2060 | 255 | **822** | **2210** | 829 | 2200 | 822 | 2220 |
| 436.cactusADM | 255 | 1479 | 2060 | 1483 | 2050 | **1480** | **2060** | 127 | 643 | 2360 | 644 | 2350 | **644** | **2360** |
| 437.leslie3d | 255 | 2973 | 806 | **2974** | **806** | 2974 | 806 | 255 | 2953 | 812 | 2957 | 810 | **2954** | **811** |
| 444.namd | 255 | **905** | **2260** | 901 | 2270 | 916 | 2230 | 255 | **901** | **2270** | 919 | 2230 | 901 | 2270 |
| 447.dealII | 255 | 958 | 3050 | 978 | 2980 | **963** | **3030** | 255 | 885 | 3300 | 960 | 3040 | **910** | **3210** |
| 450.soplex | 255 | 3685 | 577 | **3640** | **584** | 3613 | 589 | 127 | 1514 | 700 | 1491 | 711 | **1509** | **702** |
| 453.povray | 255 | 589 | 2300 | **590** | **2300** | 599 | 2270 | 255 | **439** | **3090** | 438 | 3100 | 439 | 3090 |
| 454.calculix | 255 | **768** | **2740** | 771 | 2730 | 748 | 2810 | 255 | **728** | **2890** | 725 | 2900 | 733 | 2870 |
| 459.GemsFDTD | 255 | 4290 | 631 | 4293 | 630 | **4291** | **630** | 255 | 4290 | 631 | 4293 | 630 | **4291** | **630** |
| 465.tonto | 255 | 1225 | 2050 | **1222** | **2050** | 1217 | 2060 | 255 | 1158 | 2170 | 1154 | 2170 | **1155** | **2170** |
| 470.lbm | 255 | 5376 | 652 | 5378 | 651 | **5377** | **652** | 63 | **959** | **902** | 956 | 905 | 970 | 893 |
| 481.wrf | 255 | 2223 | 1280 | **2203** | **1290** | 2195 | 1300 | 255 | 2223 | 1280 | **2203** | **1290** | 2195 | 1300 |
| 482.sphinx3 | 255 | 5135 | 968 | **5130** | **969** | 5130 | 969 | 255 | 5061 | 982 | **5068** | **981** | 5105 | 973 |

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

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

## Operating System Notes

```
Shell Environments:

    ulimit -s 131072 was used to limit the space consumed
    by the stack.(making more space available for the heap)

 System Tunables (/etc/system parameters):

 autoup=600
     Causes pages older than the listed number of seconds to
     be written by fsflush.
 zfs:zfs_arc_max = 0x10000000
     Control the amount of memory used by ZFS for caching
 lpg_alloc_prefer=1
     Prefer local pages, even if not easily available
 bufhwm=40000000
     Memory byte limit for caching I/O buffers.

 Other System Settings:

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

## Platform Notes

```
 Memory is 8-way interleaved by filling each CMU's slots with the same
 capacity DIMMs.

 This result is measured on a SPARC Enterprise M9000 server from
 Fujitsu.  The SPARC Enterprise M9000 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 -xipo=2 -xpagesize=4M -fma=fused -xlinkopt -xvector
-xalias_level=std -xprefetch_auto_type=indirect_array_access
-xprefetch_level=1 -ll2amm

C++ benchmarks:
-xdepend -fast -xipo=2 -xpagesize=4M -fma=fused -xlinkopt -xvector
-xalias_level=compatible -xprefetch_level=1 -library=no%Cstd
-I/mnt/spec//stdcxx-4.2.1/include
-I/mnt/spec//stdcxx-4.2.1/build/include -ll2amm
-L/mnt/spec//stdcxx-4.2.1/build/lib -R/mnt/spec//stdcxx-4.2.1/build/lib
-lstd8d

Fortran benchmarks:
-fast -xipo=2 -xpagesize=4M -fma=fused -xlinkopt -xvector
-xprefetch_level=2 -ll2amm

Benchmarks using both Fortran and C:
-fast(cc) -fast(f90) -xipo=2 -xpagesize=4M -fma=fused -xlinkopt
-xvector -xalias_level=std -xprefetch_auto_type=indirect_array_access
-xprefetch_level=1 -xprefetch_level=2 -ll2amm

## Base Other Flags

C benchmarks:
-xjobs=16 -V -#

C++ benchmarks:
-xjobs=16 -verbose=diags,version

Fortran benchmarks:
-xjobs=16 -V -v

Continued on next page

## Base Other Flags (Continued)

Benchmarks using both Fortran and C:
`-xjobs=16 -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 -xipo=2`
`-xpagesize=4M -fma=fused -xarch=generic -fsimple=1`
`-W2,-Ainline:rs=400 -xalias_level=std`
`-xprefetch_auto_type=indirect_array_access -xprefetch_level=2`

470.lbm: `-xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xrestrict -xipo=2`
`-xprefetch_level=2 -xarch=v8plusb -xcache=generic -ll2amm`

482.sphinx3: `-xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xipo=2`
`-xpagesize=4M -fma=fused -lfast -ll2amm`

C++ benchmarks:

444.namd: `-xdepend -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xipo=2`
`-xpagesize=4M -fma=fused -xalias_level=compatible`
`-library=stlport4 -xipo=1 -xlinkopt=2 -xprefetch=no%auto`
`-xunroll=2 -ll2amm -lfast`

447.dealII: `-xdepend -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xipo=2`
`-xpagesize=4M -fma=fused -xalias_level=compatible`
`-library=no%Cstd -I/mnt/spec//stdcxx-4.2.1/include`

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## Peak Optimization Flags (Continued)

447.dealII (continued):
-I/mnt/spec//stdcxx-4.2.1/build/include
-xprefetch_auto_type=indirect_array_access -xrestrict
-xchip=generic -xunroll=4
-L/mnt/spec//stdcxx-4.2.1/build/lib
-R/mnt/spec//stdcxx-4.2.1/build/lib -lstd8d

450.soplex: -xdepend -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2
-xpagesize=4M -fma=fused -xalias_level=compatible
-library=stlport4 -xvector -xlinkopt=2 -xprefetch=no%auto
-xarch=generic

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

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: -fast -xipo=2 -xpagesize=4M -fma=fused -xprefetch_level=2
-ll2amm

437.leslie3d: -fast -xipo=2 -xpagesize=4M -fma=fused -xprefetch=latx:5.0
-ll2amm

459.GemsFDTD: basepeak = yes

465.tonto: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2
-xpagesize=4M -fma=fused -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)
-xipo=2 -xpagesize=4M -fma=fused -xvector -xinline=
-xchip=generic -fsimple=0 -xunroll=7 -xprefetch=no%auto

436.cactusADM: -fast(cc) -fast(f90) -xipo=2 -xpagesize=4M -fma=fused

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## Peak Optimization Flags (Continued)

454.calculix: `-fast`(cc) `-fast`(f90) `-xipo=2 -xpagesize=4M -fma=fused -xvector -xunroll=8 -xprefetch=latx:3 -xalias_level=std`

481.wrf: `basepeak = yes`

## Peak Other Flags

C benchmarks:
`-xjobs=16 -V -#`

C++ benchmarks:
`-xjobs=16 -verbose=diags,version`

Fortran benchmarks:
`-xjobs=16 -V -v`

Benchmarks using both Fortran and C:
`-xjobs=16 -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`


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