



SPEC[®] CFP2006 Result

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Oracle Corporation

SPECfp[®]2006 = **96.8**

Sun Fire X4170 M3 (Intel Xeon E5-2690 2.9GHz)

SPECfp_base2006 = **86.4**

CPU2006 license: 6

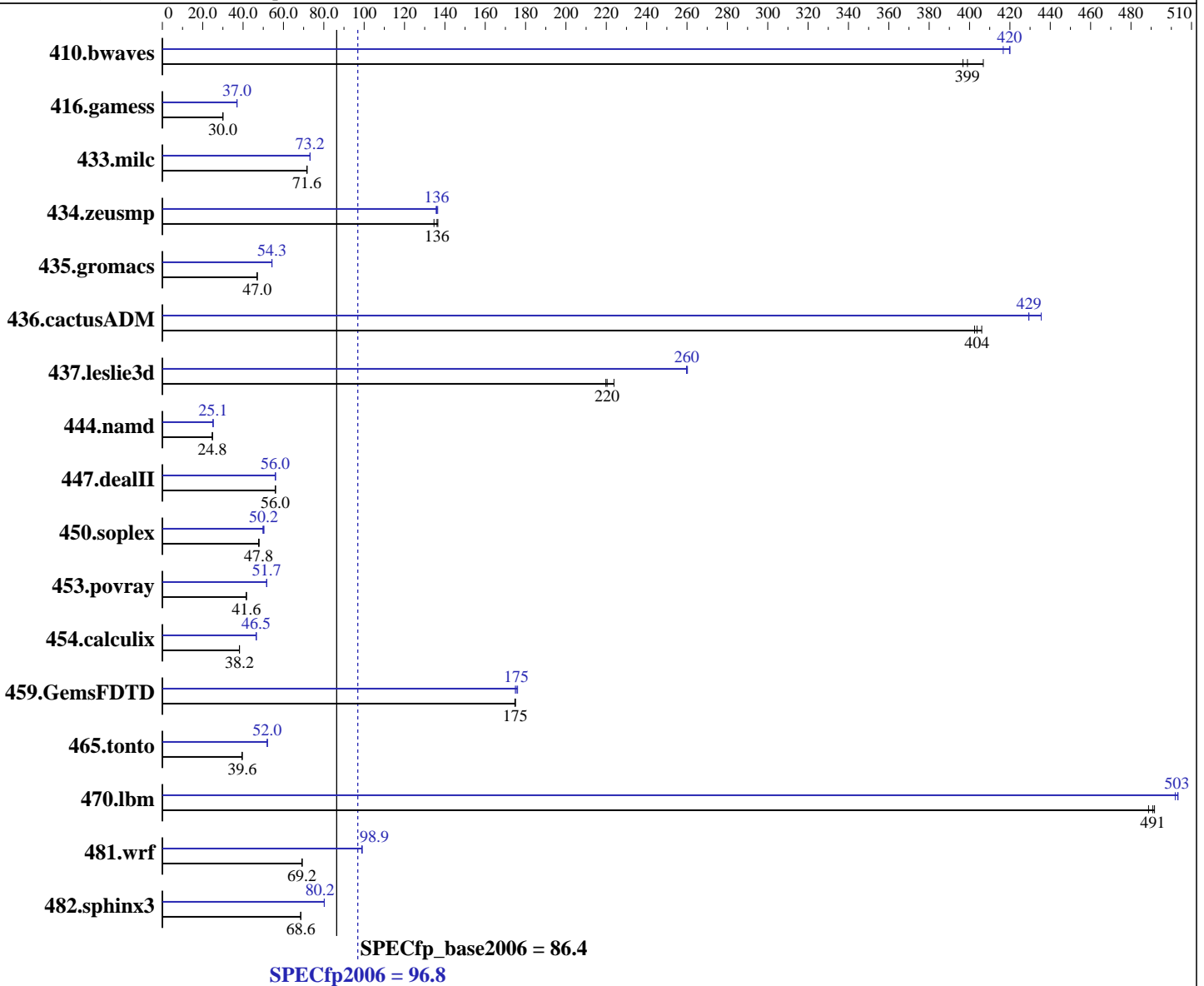
Test date: Mar-2012

Test sponsor: Oracle Corporation

Hardware Availability: Apr-2012

Tested by: Oracle Corporation

Software Availability: Jun-2012



Hardware

CPU Name: Intel Xeon E5-2690
 CPU Characteristics: Intel Turbo Boost Technology up to 3.80 GHz
 CPU MHz: 2900
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core
 CPU(s) orderable: 2 chips
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core

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Software

Operating System: Oracle Solaris 11 11/11 (SRU 02)
 Compiler: C/C++/Fortran: Version 12.3 of Oracle Solaris Studio (patch update 1, tested with nightly build 20120313)
 Auto Parallel: Yes
 File System: zfs
 System State: Default
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

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L3 Cache: 20 MB I+D on chip per chip
 Other Cache: None
 Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)
 Disk Subsystem: 1 x 300 GB 10K RPM 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	<u>34.1</u>	<u>399</u>	33.4	407	34.3	397	32.4	420	32.6	417	<u>32.4</u>	<u>420</u>
416.gamess	<u>653</u>	<u>30.0</u>	653	30.0	653	30.0	529	37.0	<u>529</u>	<u>37.0</u>	530	37.0
433.milc	128	71.6	<u>128</u>	<u>71.6</u>	128	71.7	<u>125</u>	<u>73.2</u>	125	73.2	126	73.1
434.zeusmp	67.6	135	66.6	137	<u>66.9</u>	<u>136</u>	<u>66.9</u>	<u>136</u>	66.7	136	67.1	136
435.gromacs	<u>152</u>	<u>47.0</u>	152	46.9	152	47.0	132	54.3	131	54.3	<u>131</u>	<u>54.3</u>
436.cactusADM	29.7	403	<u>29.6</u>	<u>404</u>	29.4	406	27.4	436	<u>27.8</u>	<u>429</u>	27.8	429
437.leslie3d	<u>42.7</u>	<u>220</u>	42.0	224	42.8	220	36.2	260	36.1	260	<u>36.2</u>	<u>260</u>
444.namd	323	24.8	<u>323</u>	<u>24.8</u>	323	24.8	319	25.1	319	25.1	<u>319</u>	<u>25.1</u>
447.dealII	<u>204</u>	<u>56.0</u>	204	56.0	204	56.0	204	56.0	<u>204</u>	<u>56.0</u>	204	56.0
450.soplex	174	47.9	175	47.7	<u>175</u>	<u>47.8</u>	<u>166</u>	<u>50.2</u>	167	49.8	166	50.4
453.povray	<u>128</u>	<u>41.6</u>	128	41.6	128	41.6	103	51.8	<u>103</u>	<u>51.7</u>	103	51.7
454.calculix	<u>216</u>	<u>38.2</u>	216	38.2	216	38.2	177	46.5	<u>177</u>	<u>46.5</u>	177	46.5
459.GemsFDTD	60.7	175	<u>60.7</u>	<u>175</u>	60.6	175	60.3	176	60.7	175	<u>60.5</u>	<u>175</u>
465.tonto	249	39.6	<u>249</u>	<u>39.6</u>	249	39.5	189	52.0	<u>189</u>	<u>52.0</u>	189	52.0
470.lbm	28.1	489	<u>28.0</u>	<u>491</u>	27.9	492	27.4	502	27.3	503	<u>27.3</u>	<u>503</u>
481.wrf	161	69.2	161	69.3	<u>161</u>	<u>69.2</u>	<u>113</u>	<u>98.9</u>	113	99.0	113	98.9
482.sphinx3	284	68.6	284	68.6	<u>284</u>	<u>68.6</u>	243	80.3	243	80.2	<u>243</u>	<u>80.2</u>

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

Submit Notes

The config file option 'submit' was used to bind processes to CPU threads with pbind(1)

Operating System Notes

ulimit -s 10000 (shell): increases stack

```

/etc/system parameters
  autoup=1000
  zfs:zfs_arc_max=0x400000000
  zfs:zfs_arc_min=0x400000000
  ncsiz=0x10000
  lpg_alloc_prefer=1

```

gzip compression set using "zfs set compression=gzip <zfs-filesystem>"



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Platform Notes

Default BIOS Settings were used, except:
Energy Performance set to Performance

Oracle's Sun Fire X4170 M3 is now known as the Sun Server X3-2

```
sysinfo program /export_compress/home/gnana/cpu2006v1.2/Docs/sysinfo
: 6775 2011-08-16 #f7622badcf24e01c368b1db4377c
running on bur407-122 Mon Mar 19 05:58:38 2012
```

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

```
From /usr/sbin/psrinfo -pv
Intel(r) Xeon(r) CPU E5-2690 0 @ 2.90GHz
x86 (GenuineIntel 206D7 family 6 model 45 step 7 clock 2893 MHz)
```

```
/usr/sbin/psrinfo -p: 2 chips
/usr/sbin/psrinfo -pv | grep "core has" | wc -l: 16 cores
/usr/sbin/psrinfo | wc -l: 32 threads
```

```
/usr/sbin/prtconf | grep "Memory size:": 131062 Megabytes
```

```
/etc/release: Oracle Solaris 11 11/11 X86
```

```
uname -a:
SunOS bur407-122 5.11 11.0 i86pc i386 i86pc
```

```
disk: df -h
Filesystem Size Used Available Capacity Mounted on
rpool/export_compress 274G 31G 67G 32% /export_compress
```

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
MTEXCLUSIVE = "Y"
OMP_NUM_THREADS = "16"
SUNW_MP_PROCBIND = "true"
SUNW_MP_THR_IDLE = "spin"

Base Compiler Invocation

C benchmarks:
cc

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Base Compiler Invocation (Continued)

C++ benchmarks:
cc

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

Base Portability Flags

```
410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_WORDS_LITTLEENDIAN
482.sphinx3: -DSPEC_CPU_LP64
```

Base Optimization Flags

C benchmarks:
-g -fast -xipo=2 -m64 -xautopar -xreduction -xalias_level=std

C++ benchmarks:
-fast -xipo=2 -m64 -xpagesize=2M -xalias_level=compatible
-library=stdcxx4

Fortran benchmarks:
-fast -xipo=2 -m64 -xautopar -xreduction -xpagesize=2M

Benchmarks using both Fortran and C:
-g -fast(cc) -xipo=2 -m64 -xautopar -xreduction -xalias_level=std
-fast(f90) -xpagesize=2M



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Peak Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC

Fortran benchmarks:

f90

Benchmarks using both Fortran and C:

cc f90

Peak Portability Flags

436.cactusADM: -DSPEC_CPU_LP64

481.wrf: -DSPEC_CPU_WORDS_LITTLEENDIAN

Peak Optimization Flags

C benchmarks:

433.milc: -g -fast -xipo=2 -m64 -xpagesize=2M -xalias_level=std
-xautopar -xreduction -lmtmalloc

470.lbm: -g -fast -Wu,-nontemporal -xprefetch_level=3 -xipo=2 -m64
-xautopar -xreduction -xpagesize=4K -lmtmalloc

482.sphinx3: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
-xpagesize=2M -xalias_level=std -xrestrict
-xprefetch=no%auto -xautopar -xreduction
-W2,-Aparallel:nthreads=8

C++ benchmarks:

444.namd: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xO3
-xprefetch=no%auto -m64 -xpagesize=2M
-xalias_level=compatible -library=stlport4

447.dealII: -fast -xipo=2 -m64 -xpagesize=2M -xalias_level=compatible
-library=stdcxx4

450.soplex: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2
-xpagesize=2M -xalias_level=compatible -library=stlport4
-m64 -Qoption iropt -Rtile

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Peak Optimization Flags (Continued)

```
453.povray: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xprefetch=no%auto
-xipo=2 -m64 -xpagesize=2M -xalias_level=compatible
-qoption iropt -Atiline:skew=on -qoption iropt -Ainline:cs=700
-library=stlport4
```

Fortran benchmarks:

```
410.bwaves: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
-xpagesize=4K -xautopar -xreduction
```

```
416.gamess: -fast -xipo=2 -m64 -xpagesize=2M -xunroll=1
-xvector=no%simd -xprefetch=no%auto
```

```
434.zeusmp: -fast -xipo=2 -m64 -xpagesize=2M -xautopar -xreduction
```

```
437.leslie3d: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
-xautopar -xreduction -lmtmalloc
```

459.GemsFDTD: Same as 434.zeusmp

```
465.tonto: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=2M -O3
-m64 -stackvar -xprefetch=no%auto -xalias -xautopar
-xreduction -Qoption iropt -Aparallel:nthreads=8 -lfast_r
```

Benchmarks using both Fortran and C:

```
435.gromacs: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90) -O4
-xipo=2 -m64 -xpagesize=2M -fsimple=2
-Qoption ube -fsimple=3 -xautopar -xreduction
-Qoption iropt -Aparallel:nthreads=8 -lmtmalloc
```

```
436.cactusADM: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90) -m64
-xautopar -xreduction -xpagesize=2M -lumem -lmvec
```

```
454.calculix: -g -fast(cc) -fast(f90) -xipo=0 -m64 -xpagesize=2M
-xprefetch_level=2 -xprefetch_auto_type=indirect_array_access
-Qoption ube -xprefetch_mult=24 -xunroll=2
```

```
481.wrf: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90) -O4
-xchip=nehalem -xarch=sse4_2 -xipo=2 -m64 -xpagesize=2M
-xprefetch=no%auto -xautopar -xreduction
-Qoption iropt -Aparallel:nthreads=8
```



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The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.3-x86_64.html

http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.CPUv1.2-RevA.20120425.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.3-x86_64.xml

http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.CPUv1.2-RevA.20120425.xml

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