



SPEC[®] CFP2006 Result

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Oracle Corporation

SPECfp[®]2006 = 102

Sun Fire X4-2L (Intel Xeon E5-2697 v2 2.7GHz)

SPECfp_base2006 = 87.4

CPU2006 license: 6

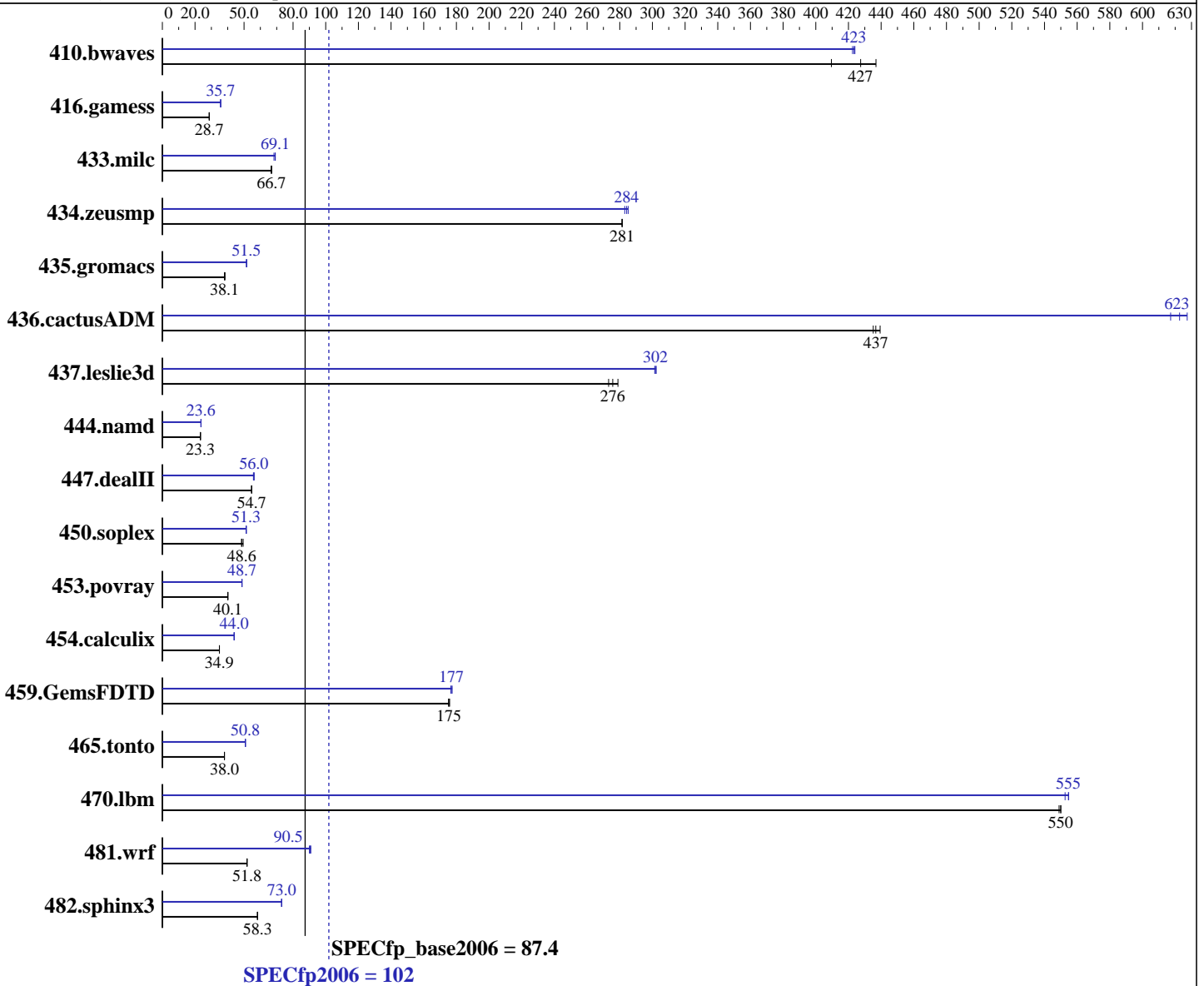
Test date: Sep-2013

Test sponsor: Oracle Corporation

Hardware Availability: Sep-2013

Tested by: Oracle Corporation

Software Availability: Nov-2013



Hardware

CPU Name: Intel Xeon E5-2697 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
 CPU MHz: 2700
 FPU: Integrated
 CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip
 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: Solaris 11.1 (SRU 11)
 Compiler: C/C++: Version 12.3 of Oracle Solaris Studio 10/13 Patch Set (tested with nightly build 20130822)
 Auto Parallel: Yes
 File System: zfs
 System State: Default
 Base Pointers: 64-bit
 Peak Pointers: 64-bit

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem: 1 x 600 GB SAS, 10K RPM
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	33.2	410	31.1	437	<u>31.8</u>	<u>427</u>	<u>32.1</u>	<u>423</u>	32.1	424	32.2	422
416.gamess	682	28.7	<u>682</u>	<u>28.7</u>	682	28.7	549	35.7	549	35.7	<u>549</u>	<u>35.7</u>
433.milc	138	66.6	137	67.0	<u>138</u>	<u>66.7</u>	<u>133</u>	<u>69.1</u>	133	69.1	134	68.3
434.zeusmp	<u>32.3</u>	<u>281</u>	32.3	282	32.3	281	32.1	283	<u>32.0</u>	<u>284</u>	31.9	285
435.gromacs	<u>187</u>	<u>38.1</u>	188	38.0	186	38.4	138	51.6	139	51.5	<u>139</u>	<u>51.5</u>
436.cactusADM	<u>27.4</u>	<u>437</u>	27.2	439	27.5	435	<u>19.2</u>	<u>623</u>	19.4	617	19.0	627
437.leslie3d	34.4	273	<u>34.1</u>	<u>276</u>	33.7	279	31.1	302	<u>31.1</u>	<u>302</u>	31.2	301
444.namd	344	23.3	344	23.3	<u>344</u>	<u>23.3</u>	<u>339</u>	<u>23.6</u>	339	23.6	339	23.6
447.dealII	209	54.7	209	54.6	<u>209</u>	<u>54.7</u>	205	55.7	204	56.2	<u>204</u>	<u>56.0</u>
450.soplex	169	49.5	172	48.5	<u>172</u>	<u>48.6</u>	162	51.4	163	51.3	<u>163</u>	<u>51.3</u>
453.povray	133	40.1	133	40.1	<u>133</u>	<u>40.1</u>	<u>109</u>	<u>48.7</u>	109	48.8	109	48.7
454.calculix	236	34.9	<u>236</u>	<u>34.9</u>	236	35.0	188	44.0	188	44.0	<u>188</u>	<u>44.0</u>
459.GemsFDTD	60.3	176	60.6	175	<u>60.5</u>	<u>175</u>	60.1	177	59.8	177	<u>60.0</u>	<u>177</u>
465.tonto	259	38.0	<u>259</u>	<u>38.0</u>	259	38.1	<u>194</u>	<u>50.8</u>	194	50.8	194	50.8
470.lbm	25.0	549	<u>25.0</u>	<u>550</u>	25.0	550	<u>24.8</u>	<u>555</u>	24.9	553	24.8	555
481.wrf	216	51.8	215	52.0	<u>216</u>	<u>51.8</u>	<u>123</u>	<u>90.5</u>	123	90.9	124	90.0
482.sphinx3	335	58.2	335	58.3	<u>335</u>	<u>58.3</u>	<u>267</u>	<u>73.0</u>	267	73.1	267	73.0

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 unlimited (shell): increases stack
/etc/system parameters
autoup=1000
tune_t_fsflushr=10
```

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



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Platform Notes

Default BIOS Settings were used except:
Hyper-Threading (HT) Technology was Disabled

```
Sysinfo program /export/home/cpu2006v1.2/Docs/sysinfo
: 6775 2011-08-16 #f7622badcf24e01c368b1db4377c
running on x4-2l-001 Mon Sep 2 12:38:54 2013
```

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 E5-2697 v2 @ 2.70GHz
x86 (GenuineIntel 306E4 family 6 model 62 step 4 clock 2693 MHz)
```

```
/usr/sbin/psrinfo -p: 2 chips
/usr/sbin/psrinfo | wc -l: 24 threads
```

```
/usr/sbin/prtconf | grep "Memory size:": 262087 Megabytes
```

```
/etc/release:
Oracle Solaris 11.1 X86
```

```
uname -a:
SunOS x4-2l-001 5.11 11.1 i86pc i386 i86pc
```

```
disk: df -h
Filesystem      Size  Used  Available Capacity  Mounted on
rpool/export/home 547G   33G   440G         8%   /export/home
```

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:

```
MTEXCLUSIVE = "Y"
OMP_NUM_THREADS = "24"
SUNW_MP_PROCBIND = "scatter"
SUNW_MP_THR_IDLE = "spin"
```

Base Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

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Base Compiler Invocation (Continued)

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 -xtarget=ivybridge -xipo=2 -m64 -xautopar -xreduction
-xalias_level=std

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

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

Benchmarks using both Fortran and C:
-g -fast(cc) -xtarget=ivybridge -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 -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -m64 -xpagesize=2M -xalias_level=std -xautopar
-xreduction -W2,-Aparallel:nthreads=12 -lmtmalloc

470.lbm: -g -fast -xtarget=ivybridge -xipo=2 -m64 -xautopar
-xreduction -xpagesize=4K -xprefetch_level=3 -lmtmalloc

482.sphinx3: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -m64 -xpagesize=2M -xalias_level=std -xrestrict
-xprefetch=no%auto -xautopar -xreduction
-W2,-Aparallel:nthreads=12

C++ benchmarks:

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

447.dealIII: -g -fast -xtarget=ivybridge -xipo=2 -m64 -xpagesize=2M
-xalias_level=compatible -library=stdcxx4 -xrestrict

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Peak Optimization Flags (Continued)

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

453.povray: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xprefetch=no%auto -xipo=2 -m64 -xpagesize=2M
-xalias_level=compatible -qoption iropt -Atile:skew=on
-qoption iropt -Ainline:cs=700 -library=stdcxx4

Fortran benchmarks:

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

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

434.zeusmp: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xipo=2 -m64 -xpagesize=2M -xautopar -xreduction

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

459.GemsFDTD: Same as 434.zeusmp

465.tonto: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=ivybridge
-xpagesize=2M -O3 -m64 -stackvar -xprefetch=no%auto
-xalias -xautopar -xreduction
-Qoption iropt -Aparallel:nthreads=12 -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)
-xtarget=ivybridge -xipo=2 -m64 -xpagesize=2M -fsimple=2
-Qoption ube -fsimple=3 -O4 -xautopar -xreduction
-Qoption iropt -Aparallel:nthreads=12 -lmtmalloc

436.cactusADM: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xtarget=ivybridge -m64 -xautopar -xreduction
-xpagesize=2M -lumem -lmvec -xprefetch_level=3

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Peak Optimization Flags (Continued)

```
454.calculix: -g -fast(cc) -fast(f90) -xtarget=ivybridge -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)
          -xtarget=ivybridge -O4 -xchip=nehalem -xarch=sse4_2
          -xipo=2 -m64 -xpagesize=2M -xprefetch=no%auto -xautopar
          -xreduction -Qoption iropt -Aparallel:nthreads=12
```

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_64.20130924.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_64.20130924.xml

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

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