# SPEC® CFP2006 Result
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## Oracle Corporation

Sun Blade X6275 M2 Server Module (Intel Xeon X5675 3.06 GHz)

$SPECfp®\_rate2006 = 515$

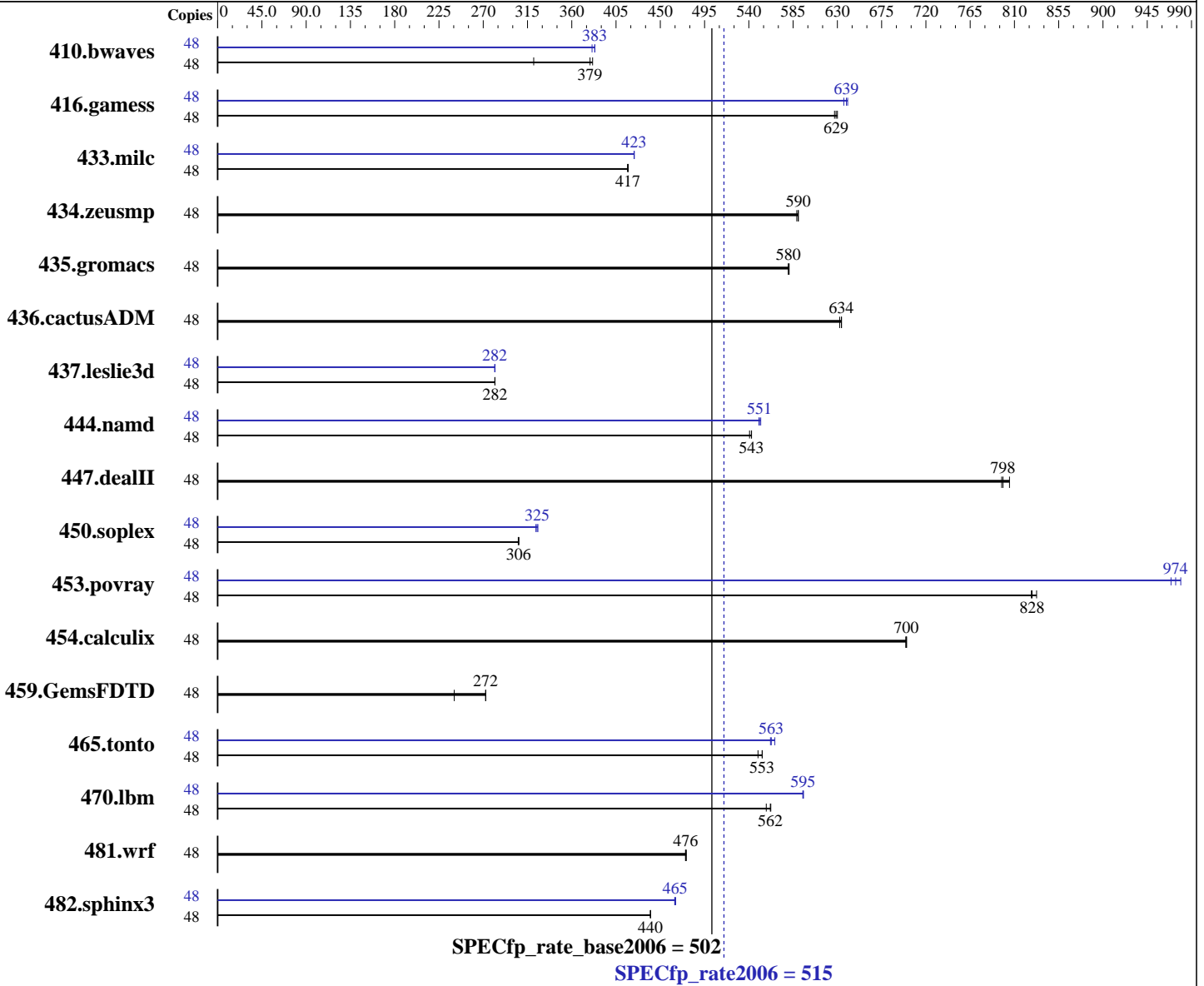$SPECfp\_rate\_base2006 = 502$

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

**Test date:** Jan-2011
**Hardware Availability:** Mar-2011
**Software Availability:** Nov-2010



SPECfp_rate_base2006 = 502

SPECfp_rate2006 = 515

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X5675 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.46 GHz |
| CPU MHz: | 3067 |
| FPU: | Integrated |
| CPU(s) enabled: | 24 cores, 4 chips, 6 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1 or 2 chips per Sun Blade X6275 M2 node |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |

*Continued on next page*

## Software

| | |
|---|---|
| Operating System: | Oracle Linux 5.5 kernel 2.6.18-194.el5 |
| Compiler: | Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0.1.116 Build 20101116 |
| Auto Parallel: | No |
| File System: | NFSv4 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

*Continued on next page*

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| | |
|---|---|
| L3 Cache: | 12 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC, per node) |
| Disk Subsystem: | Sun Storage 7410 System via NFS (See additional details below) |
| Other Hardware: | None |

| | |
|---|---|
| Peak Pointers: | 32/64-bit |
| Other Software: | None |

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 48 | 2030 | 321 | **1723** | **379** | 1711 | 381 | 48 | 1701 | 383 | 1714 | 381 | **1702** | **383** |
| 416.gamess | 48 | 1499 | 627 | 1492 | 630 | **1495** | **629** | 48 | 1477 | 637 | **1470** | **639** | 1467 | 640 |
| 433.milc | 48 | 1057 | 417 | **1056** | **417** | 1056 | 417 | 48 | 1041 | 423 | 1040 | 424 | **1041** | **423** |
| 434.zeusmp | 48 | 740 | 590 | 742 | 589 | **740** | **590** | 48 | 740 | 590 | 742 | 589 | **740** | **590** |
| 435.gromacs | 48 | 590 | 581 | 591 | 580 | **591** | **580** | 48 | 590 | 581 | 591 | 580 | **591** | **580** |
| 436.cactusADM | 48 | 907 | 632 | **905** | **634** | 904 | 634 | 48 | 907 | 632 | **905** | **634** | 904 | 634 |
| 437.leslie3d | 48 | 1601 | 282 | **1601** | **282** | 1601 | 282 | 48 | 1600 | 282 | 1601 | 282 | **1601** | **282** |
| 444.namd | 48 | 709 | 543 | **709** | **543** | 712 | 541 | 48 | 700 | 550 | 697 | 552 | **699** | **551** |
| 447.dealII | 48 | **688** | **798** | 682 | 805 | 689 | 797 | 48 | **688** | **798** | 682 | 805 | 689 | 797 |
| 450.soplex | 48 | 1310 | 306 | **1308** | **306** | 1307 | 306 | 48 | 1237 | 324 | 1230 | 326 | **1233** | **325** |
| 453.povray | 48 | 309 | 827 | **308** | **828** | 307 | 833 | 48 | **262** | **974** | 261 | 979 | 263 | 969 |
| 454.calculix | 48 | 566 | 700 | **566** | **700** | 565 | 700 | 48 | 566 | 700 | **566** | **700** | 565 | 700 |
| 459.GemsFDTD | 48 | 2117 | 241 | **1870** | **272** | 1869 | 273 | 48 | 2117 | 241 | **1870** | **272** | 1869 | 273 |
| 465.tonto | 48 | 853 | 554 | **853** | **553** | 860 | 549 | 48 | 840 | 562 | 834 | 566 | **839** | **563** |
| 470.lbm | 48 | **1174** | **562** | 1183 | 558 | 1173 | 562 | 48 | 1107 | 596 | 1108 | 595 | **1108** | **595** |
| 481.wrf | 48 | 1125 | 476 | **1127** | **476** | 1127 | 476 | 48 | 1125 | 476 | **1127** | **476** | 1127 | 476 |
| 482.sphinx3 | 48 | 2126 | 440 | **2126** | **440** | 2126 | 440 | 48 | 2009 | 466 | 2013 | 465 | **2012** | **465** |

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, along with submit.pl to
    distribute jobs to two nodes of the Sun Blade X6275 M2 server module.
    It also uses numactl to bind copies to the cores.
```

## Operating System Notes

```
    'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
```

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## Platform Notes

```
Load Default BIOS Settings and then change the following
  Data Reuse Optimization Disabled
  Hardware Prefetch Enabled
  Adjacent Cache Line Prefetch Enabled
  L1 Data Prefetch Enabled
  Intel Hyperthreading Options Enabled

Storage Configuration for Disk Subsystem:
Sun Storage 7410 has 2 x J4400 disk shelves. There are 22 x 750 GB
7200 RPM SATA Disks per J4400 disk shelf under RAID-1 configuration
mounted over 10GBE network interface with these options
"rw,noacl,hard,intr,rsize=65536,wsize=65536" in the /etc/fstab.
```

## General Notes

```
  Though binaries were linked with hugepages, this result did not use hugepages.
Binaries were compiled on RHEL5.5 with Binutils binutils-2.17.50.0.6-14.el5
```

## Base Compiler Invocation

C benchmarks:
```
    icc   -m64
```

C++ benchmarks:
```
    icpc  -m64
```

Fortran benchmarks:
```
    ifort -m64
```

Benchmarks using both Fortran and C:
```
    icc   -m64 ifort -m64
```

## 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 -nofor_main
 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
   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 -nofor_main
```

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## Base Portability Flags (Continued)

```
459.GemsFDTD: -DSPEC_CPU_LP64
    465.tonto: -DSPEC_CPU_LP64
     470.lbm: -DSPEC_CPU_LP64
     481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
 482.sphinx3: -DSPEC_CPU_LP64
```

## Base Optimization Flags

C benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias
```

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias
```

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static
```

Benchmarks using both Fortran and C:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias
```

## Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc    -m64
```

```
482.sphinx3: icc -m32
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```

```
450.soplex: icpc -m32
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc    -m64 ifort -m64
```

## Peak Portability Flags

```
410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
  433.milc: -DSPEC_CPU_LP64
```

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# Peak Portability Flags (Continued)

```
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
```

# Peak Optimization Flags

C benchmarks:

```
433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32

470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
         -ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2
```

C++ benchmarks:

```
444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
          -auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
            -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
            -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT
```

Fortran benchmarks:

```
410.bwaves: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -prof-use(pass 2) -static
```

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# Peak Optimization Flags (Continued)

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: -xSSE4.2 -ipo -O3 -no-prec-div
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto
-inline-calloc -opt-malloc-options=3
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revA.html
http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.20101027.html
http://www.spec.org/cpu2006/flags/Sun-Blade-6275M2.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revA.xml
http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.20101027.xml
http://www.spec.org/cpu2006/flags/Sun-Blade-6275M2.xml

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