# SPEC® CFP2006 Result

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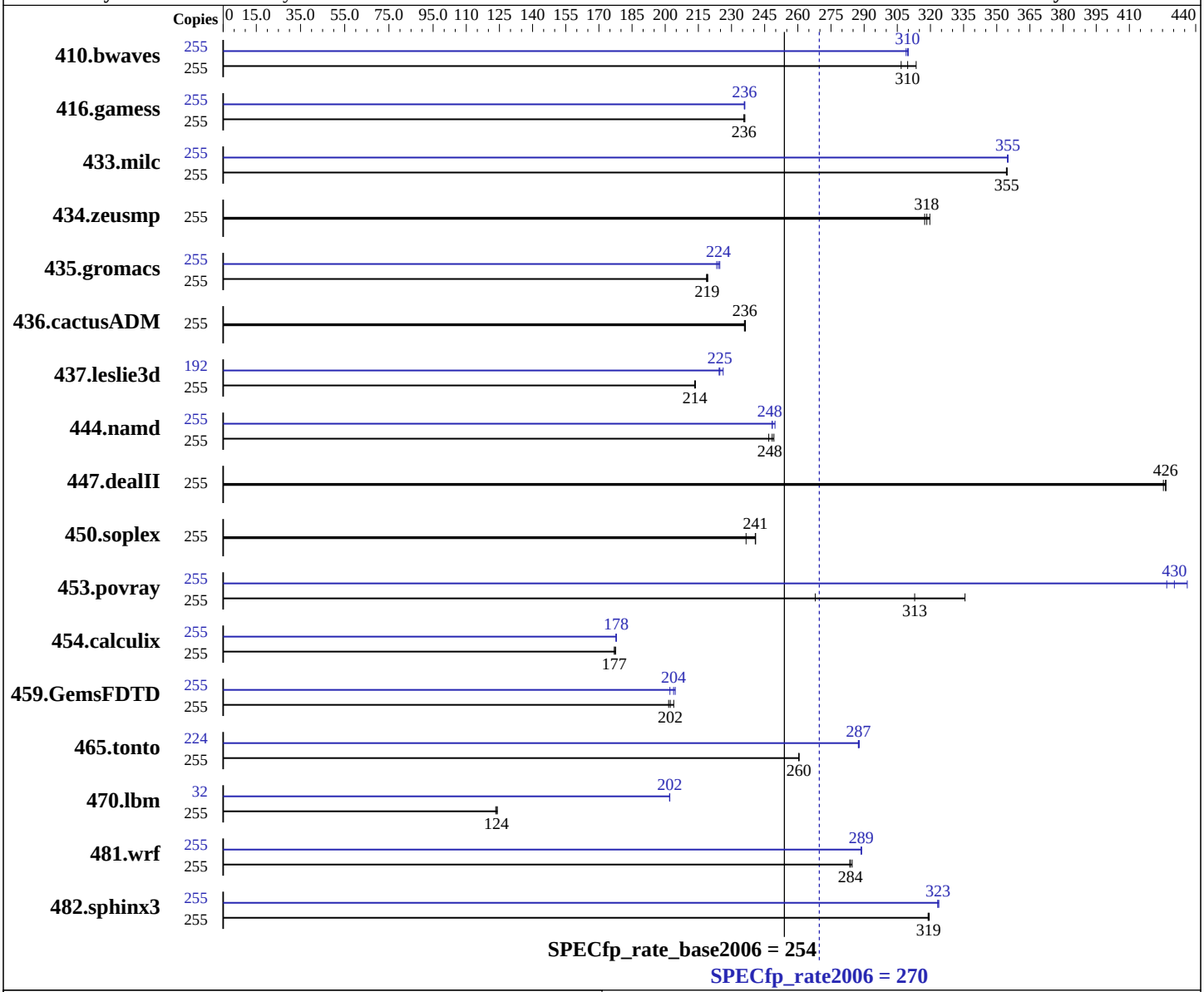
## Sun Microsystems
## Sun SPARC Enterprise T5440

**SPECfp®_rate2006 = 270**

**SPECfp_rate_base2006 = 254**

**CPU2006 license:** 6
**Test sponsor:** Sun Microsystems
**Tested by:** Sun Microsystems

**Test date:** May-2009
**Hardware Availability:** Jul-2009
**Software Availability:** Jun-2009




### Hardware

| | |
|---|---|
| CPU Name: | UltraSPARC T2 Plus |
| CPU Characteristics: | |
| CPU MHz: | 1596 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 4 chips, 8 cores/chip, 8 threads/core |
| CPU(s) orderable: | 1 to 4 chips |
| Primary Cache: | 16 KB I + 8 KB D on chip per core |
| Secondary Cache: | 4 MB I+D on chip per chip |

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### Software

| | |
|---|---|
| Operating System: | Solaris 10 5/09 |
| Compiler: | Sun Studio 12 Update 1 |
| 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: 256 GB (64 x 4 GB)
Disk Subsystem: 536 GB using ZFS 3-way mirroring on 24x 15K SUN72G FC (on 2x SE3510)
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 | 11053 | 314 | 11297 | 307 | **11190** | **310** | 255 | **11189** | **310** | 11180 | 310 | 11215 | 309 |
| 416.gamess | 255 | **21186** | **236** | 21187 | 236 | 21151 | 236 | 255 | 21153 | 236 | **21163** | **236** | 21177 | 236 |
| 433.milc | 255 | 6600 | 355 | 6606 | 354 | **6602** | **355** | 255 | 6597 | 355 | **6594** | **355** | 6593 | 355 |
| 434.zeusmp | 255 | 7258 | 320 | 7311 | 317 | **7289** | **318** | 255 | 7258 | 320 | 7311 | 317 | **7289** | **318** |
| 435.gromacs | 255 | 8326 | 219 | 8304 | 219 | **8314** | **219** | 255 | 8153 | 223 | 8102 | 225 | **8125** | **224** |
| 436.cactusADM | 255 | **12910** | **236** | 12921 | 236 | 12895 | 236 | 255 | **12910** | **236** | 12921 | 236 | 12895 | 236 |
| 437.leslie3d | 255 | 11238 | 213 | **11227** | **214** | 11218 | 214 | 192 | **8032** | **225** | 7978 | 226 | 8043 | 224 |
| 444.namd | 255 | **8233** | **248** | 8207 | 249 | 8285 | 247 | 255 | 8191 | 250 | 8236 | 248 | **8231** | **248** |
| 447.dealII | 255 | 6839 | 427 | **6842** | **426** | 6858 | 425 | 255 | 6839 | 427 | **6842** | **426** | 6858 | 425 |
| 450.soplex | 255 | 8989 | 237 | **8834** | **241** | 8827 | 241 | 255 | 8989 | 237 | **8834** | **241** | 8827 | 241 |
| 453.povray | 255 | **4336** | **313** | 4042 | 336 | 5064 | 268 | 255 | 3178 | 427 | 3110 | 436 | **3152** | **430** |
| 454.calculix | 255 | 11846 | 178 | 11885 | 177 | **11883** | **177** | 255 | 11837 | 178 | 11826 | 178 | **11831** | **178** |
| 459.GemsFDTD | 255 | **13373** | **202** | 13272 | 204 | 13423 | 202 | 255 | **13276** | **204** | 13227 | 205 | 13385 | 202 |
| 465.tonto | 255 | 9630 | 261 | 9634 | 260 | **9634** | **260** | 224 | 7670 | 287 | **7668** | **287** | 7659 | 288 |
| 470.lbm | 255 | **28328** | **124** | 28242 | 124 | 28409 | 123 | 32 | 2176 | 202 | **2177** | **202** | 2177 | 202 |
| 481.wrf | 255 | **10036** | **284** | 10046 | 284 | 10009 | 285 | 255 | 9869 | 289 | 9860 | 289 | **9867** | **289** |
| 482.sphinx3 | 255 | 15558 | 319 | **15571** | **319** | 15583 | 319 | 255 | 15349 | 324 | 15371 | 323 | **15368** | **323** |

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

## Compiler Invocation Notes

```
Sun Studio 12 Update 1 pre-release build 41.1 was used.
```

## Submit Notes

```
A processor set was created using
  psrset -c 1-255
and the runspec process was placed into the set using
  psrset -e 1
The config file option 'submit' was used to select specific
processors within the set, along with the pbind command.
```

## 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.


/etc/system parameters
   autoup=600
      Causes pages older than the listed number of seconds to
      be written by fsflush.
   tune_t_fsflushr=10
      Controls how many seconds elapse between runs of the
      page flush daemon, fsflush.
   tsb_rss_factor=128
      Suggests that the the size of the TSB (Translation Storage Buffer)
      may be increased if it is more than 25% (128/512) full.  Doing so
      may reduce TSB traps, at the cost of additional kernel memory.
   zfs:zfs_arc_max = 0x10000000
      Limits the consumption of memory by the zfs file system

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

The system had 229 GB of swap space.
```

## Platform Notes

```
This result was measured on a Sun SPARC Enterprise T5440.
The Sun SPARC Enterprise T5440 and the Fujitsu SPARC
Enterprise T5440 are electrically equivalent.
```

# 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:
```
-g -fast -xipo=2 -xpagesize=4M -xprefetch_level=2 -xalias_level=std
-xprefetch_level=3 -xprefetch_auto_type=indirect_array_access
-M /usr/lib/ld/map.bssalign
```

C++ benchmarks:
```
-g0 -library=stlport4 -fast -xipo=2 -xpagesize=4M -xprefetch_level=2
-xdepend -xalias_level=compatible -M /usr/lib/ld/map.bssalign
```

Fortran benchmarks:
```
-g -fast -xipo=2 -xpagesize=4M -xprefetch_level=2
-M /usr/lib/ld/map.bssalign
```

Benchmarks using both Fortran and C:
```
-g -fast(cc) -fast(f90) -xipo=2 -xpagesize=4M -xprefetch_level=2
-xalias_level=std -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access -M /usr/lib/ld/map.bssalign
```

## Base 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
```

## 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: `-g -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-M /usr/lib/ld/map.bssalign -xipo=2 -xprefetch_level=2`
`-xprefetch_auto_type=indirect_array_access -xalias_level=std`
`-fsimple=1`

470.lbm: `-g -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-M /usr/lib/ld/map.bssalign -xprefetch_level=3 -xipo=2`
`-xrestrict`

482.sphinx3: `-g -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-M /usr/lib/ld/map.bssalign -xinline= -xprefetch_level=2`
`-Wc,-Qlp-ol=1 -xrestrict -xalias_level=strong -fsimple=1`
`-xlinkopt=2 -lfast`

C++ benchmarks:

444.namd: `-g0 -library=stlport4 -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-xdepend -xalias_level=compatible`
`-M /usr/lib/ld/map.bssalign -xprefetch_level=1 -xlinkopt=2`

447.dealII: `basepeak = yes`

450.soplex: `basepeak = yes`

453.povray: `-g0 -library=stlport4 -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=64K`
`-xdepend -xalias_level=compatible -xipo=2 -xrestrict`
`-xlinkopt=2`

Fortran benchmarks:

410.bwaves: `-g -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-M /usr/lib/ld/map.bssalign -xipo=2 -xprefetch_level=2`

416.gamess: `-g -xprofile=collect:./feedback`(pass 1)
`-xprofile=use:./feedback`(pass 2) `-fast -xpagesize=4M`
`-M /usr/lib/ld/map.bssalign -xlinkopt=2`

434.zeusmp: `basepeak = yes`

437.leslie3d: `-g -fast -xpagesize_heap=4M -xpagesize_stack=64K`
`-M /usr/lib/ld/map.bssalign -xprefetch_level=3`
`-xprefetch=latx:1.6 -qoption cg -Qlp=1 -qoption cg -Qlp-fa=0`
`-qoption cg -Qlp-fl=1 -qoption cg -Qlp-av=448`

Continued on next page

# Peak Optimization Flags (Continued)

437.leslie3d (continued):
-qoption cg -Qlp-t=4

459.GemsFDTD: -g -fast -xpagesize=4M -M /usr/lib/ld/map.bssalign
-fsimple=1

465.tonto: -g -fast -xpagesize=4M -M /usr/lib/ld/map.bssalign -xipo=2
-lfast

Benchmarks using both Fortran and C:

435.gromacs: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -M /usr/lib/ld/map.bssalign -xipo=1 -xinline=
-xarch=generic -xchip=generic -fsimple=0

436.cactusADM: basepeak = yes

454.calculix: -g -fast(cc) -fast(f90) -xpagesize=4M
-M /usr/lib/ld/map.bssalign -xipo=2 -xvector
-xprefetch_level=1

481.wrf: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -M /usr/lib/ld/map.bssalign -xlinkopt=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/Sun-Solaris-Studio12-12u1-and-gccfss4.2.r3.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-12u1-and-gccfss4.2.r3.xml

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