# SPEC® CFP2006 Result



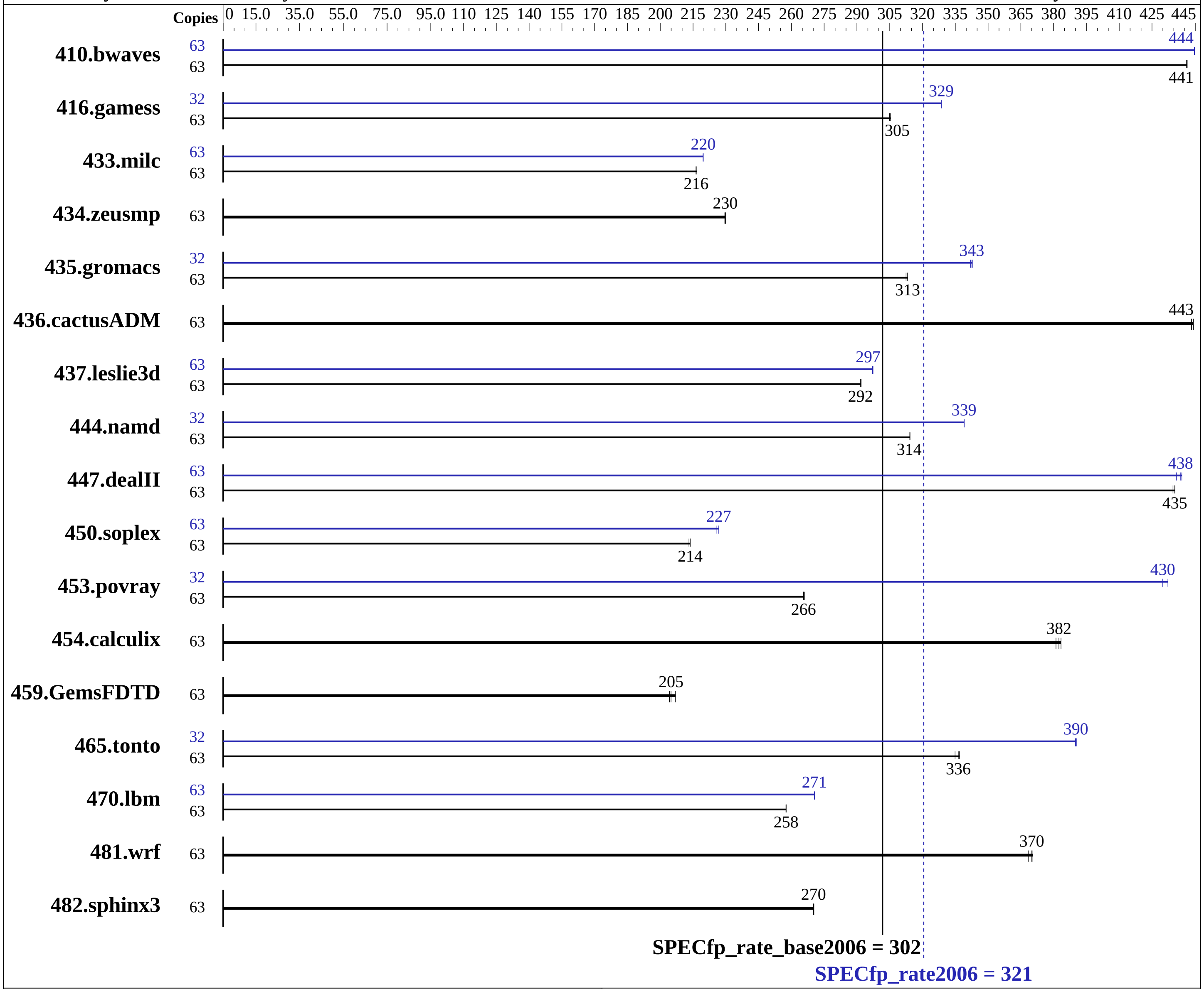
## Fujitsu Limited

## Fujitsu SPARC Enterprise M8000

**SPECfp®_rate2006 = 321**

**SPECfp_rate_base2006 = 302**

| | | | |
|---|---|---|---|
| **CPU2006 license:** | 19 | **Test date:** | Apr-2007 |
| **Test sponsor:** | Fujitsu Limited | **Hardware Availability:** | Apr-2007 |
| **Tested by:** | Sun Microsystems | **Software Availability:** | Jul-2007 |




### Hardware

| | |
|---|---|
| CPU Name: | SPARC64 VI |
| CPU Characteristics: | |
| CPU MHz: | 2280 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 16 chips, 2 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1 to 4 CMUs; each CMU contains 2 or 4 chips |
| Primary Cache: | 128 KB I + 128 KB D on chip per core |
| Secondary Cache: | 5 MB I+D on chip per chip |

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### Software

| | |
|---|---|
| Operating System: | Solaris 10 7/07 (build s10s_u4wos_03) |
| Compiler: | Sun Studio 12 (build 44.0) |
| Auto Parallel: | No |
| File System: | ufs |
| 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 (128 x 2 GB) |
| Disk Subsystem: | 400 GB Solaris Volume Manager RAID0 soft partition (see notes for details) |
| Other Hardware: | None |

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 63 | 1942 | 441 | 1941 | 441 | **1942** | **441** | 63 | **1926** | **444** | 1926 | 445 | 1927 | 444 |
| 416.gamess | 63 | 4046 | 305 | **4044** | **305** | 4039 | 305 | 32 | **1907** | **329** | 1907 | 329 | 1906 | 329 |
| 433.milc | 63 | 2668 | 217 | 2673 | 216 | **2672** | **216** | 63 | 2633 | 220 | **2633** | **220** | 2634 | 220 |
| 434.zeusmp | 63 | 2494 | 230 | 2497 | 230 | **2495** | **230** | 63 | 2494 | 230 | 2497 | 230 | **2495** | **230** |
| 435.gromacs | 63 | 1440 | 312 | 1436 | 313 | **1436** | **313** | 32 | **667** | **343** | 668 | 342 | 666 | 343 |
| 436.cactusADM | 63 | 1696 | 444 | 1700 | 443 | **1699** | **443** | 63 | 1696 | 444 | 1700 | 443 | **1699** | **443** |
| 437.leslie3d | 63 | 2032 | 292 | **2030** | **292** | 2029 | 292 | 63 | 1993 | 297 | 1992 | 297 | **1993** | **297** |
| 444.namd | 63 | **1608** | **314** | 1608 | 314 | 1608 | 314 | 32 | 757 | 339 | **757** | **339** | 757 | 339 |
| 447.dealII | 63 | 1658 | 435 | 1655 | 435 | **1655** | **435** | 63 | 1643 | 439 | 1652 | 436 | **1645** | **438** |
| 450.soplex | 63 | 2465 | 213 | **2459** | **214** | 2459 | 214 | 63 | 2326 | 226 | 2316 | 227 | **2317** | **227** |
| 453.povray | 63 | **1262** | **266** | 1260 | 266 | 1262 | 265 | 32 | 396 | 430 | 394 | 432 | **396** | **430** |
| 454.calculix | 63 | 1356 | 383 | 1364 | 381 | **1359** | **382** | 63 | 1356 | 383 | 1364 | 381 | **1359** | **382** |
| 459.GemsFDTD | 63 | 3229 | 207 | **3262** | **205** | 3273 | 204 | 63 | 3229 | 207 | **3262** | **205** | 3273 | 204 |
| 465.tonto | 63 | 1851 | 335 | **1843** | **336** | 1840 | 337 | 32 | 807 | 390 | **807** | **390** | 807 | 390 |
| 470.lbm | 63 | 3361 | 258 | **3361** | **258** | 3360 | 258 | 63 | **3200** | **271** | 3199 | 271 | 3200 | 270 |
| 481.wrf | 63 | **1902** | **370** | 1899 | 371 | 1909 | 369 | 63 | **1902** | **370** | 1899 | 371 | 1909 | 369 |
| 482.sphinx3 | 63 | **4545** | **270** | 4543 | 270 | 4547 | 270 | 63 | **4545** | **270** | 4543 | 270 | 4547 | 270 |

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

## Operating System Notes

```
Processes were bound to cores using "submit" and "pbind".
The SPEC toolset was bound to processor 0.

These shell commands request use of local 4MB pages:
      export LD_PRELOAD=madv.so.1:mpss.so.1
      export MPSSHEAP=4MB
      export MPSSSTACK=4MB
      export MADV=access_lwp
'access_lwp' means that the next light weight
process to touch the specified address range
will access it the most heavily.

ulimit -s 131072 was used to limit the space
```

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## Operating System Notes (Continued)

```
consumed by the stack (and therefore make more
space available to the heap).

 /etc/system parameters
    autoup=300
       Causes pages older than the listed number of seconds to
       be written by fsflush.
    bufhwm=3000
       Memory byte limit for caching I/O buffers
    segmap_percent=1
       Set maximum percent memory for file system cache
    tune_t_fsflushr=3
       Controls how many seconds elapse between runs of the
       page flush daemon, fsflush.

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

## Platform Notes

```
Disk notes: The SPEC CPU tests use a 400 GB partition
created from 3x Sun StorageTek 6140 stripe sets.  The
partition was created in 3 steps: 1. Each 6140 stripe
set (RAID 0) is based on 8x 146 GB 15,000 RPM Seagate
ST3146954FC FC-AL disks.  2. Solaris views these as 3
logical units (LUNs) which are striped together (RAID
0) to make a 3 TB volume using Solaris Volume Manager
(SVM).  3. Lastly, SVM is then used to create one 400
GB soft partition for use by the CPU2006 output_root.

"CMU" = CPU/Memory Unit; each holds 2 or 4 CPU chips.

Memory was 8-way interleaved by filling all slots with
the same capacity DIMMs.

This result was measured using a Sun SPARC Enterprise
M8000 Server.  Note that the Fujitsu SPARC Enterprise
M8000 and Sun SPARC Enterprise M8000 are electrically
equivalent.
```

## 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 Optimization Flags

C benchmarks:
`-fast -fma=fused -xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M -xprefetch_level=2 -xprefetch=latx:2 -xalias_level=std -xprefetch_level=3 -xprefetch_auto_type=indirect_array_access`

C++ benchmarks:
`-xdepend -library=stlport4 -fast -fma=fused -xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M -xprefetch_level=2 -xprefetch=latx:2 -xalias_level=compatible`

Fortran benchmarks:
`-fast -fma=fused -xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M -xprefetch_level=2 -xprefetch=latx:2`

Benchmarks using both Fortran and C:
`-fast`(cc) `-fast`(f90) `-fma=fused -xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M -xprefetch_level=2 -xprefetch=latx:2 -xalias_level=std -xprefetch_level=3 -xprefetch_auto_type=indirect_array_access`

## Base 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`

# 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: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2 -xprefetch_level=2 -fsimple=1 -xprefetch_auto_type=indirect_array_access -W2,-Ainline:rs=400 -xalias_level=std -fma=fused -xprefetch=latx:3

470.lbm: -xprofile=collect:./feedback(pass 1) -xprofile=use:./feedback(pass 2) -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xprefetch_level=3 -xipo=2 -xrestrict -fma=fused -Wc,-Qlp=1 -Wc,-Qlp-av=512 -Wc,-Qlp-t=1 -Wc,-Qlp-fa=1 -Wc,-Qms_pipe-prefolim=64 -xprefetch=latx:5

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xdepend -library=stlport4 -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xalias_level=compatible -xprefetch_level=1 -fma=fused -xprefetch=latx:3

447.dealII: -xdepend -library=stlport4 -xprofile=collect:./feedback(pass 1) -xprofile=use:./feedback(pass 2) -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xalias_level=compatible -xipo=2 -xrestrict -fma=fused -xprefetch=latx:4.5

450.soplex: -xdepend -library=stlport4 -xprofile=collect:./feedback(pass 1) -xprofile=use:./feedback(pass 2) -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M

Continued on next page

## Peak Optimization Flags (Continued)

450.soplex (continued):
-xalias_level=compatible -xipo=2 -xprefetch_level=2
-fsimple=0 -xrestrict
-xprefetch_auto_type=indirect_array_access
-Qoption cg -Qlp-ol=1 -Qoption cg -Qlp-it=3
-Qoption cg -Qlp-imb=1 -Qoption iropt -Apf:pdl=3

453.povray: -xdepend -library=stlport4
-xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast
-xcache=128/64/2:5120/256/10 -xpagesize=4M
-xalias_level=compatible -xipo=2 -xrestrict -fma=fused

Fortran benchmarks:

410.bwaves: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xprefetch_level=2 -fma=fused -xprefetch=latx:3

416.gamess: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xprefetch_level=2 -fma=fused

434.zeusmp: basepeak = yes

437.leslie3d: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M
-xprefetch_level=3 -qoption cg -Qlp=1 -qoption cg -Qlp-fa=0
-qoption cg -Qlp-fl=1 -qoption cg -Qlp-av=448
-qoption cg -Qlp-t=4 -xprefetch=latx:3.5

459.GemsFDTD: basepeak = yes

465.tonto: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xprefetch=latx:12 -lfast

Benchmarks using both Fortran and C:

435.gromacs: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2
-xinline= -xarch=generic -xchip=generic -fsimple=0
-fma=fused

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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/Sun-Solaris-Studio12.20090714.02.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12.20090714.02.xml



For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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