



# SPEC<sup>®</sup> CFP2006 Result

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## Fujitsu

### SPECfp<sup>®</sup>\_rate2006 = 270

## Fujitsu SPARC Enterprise T5440

### SPECfp\_rate\_base2006 = 254

CPU2006 license: 6

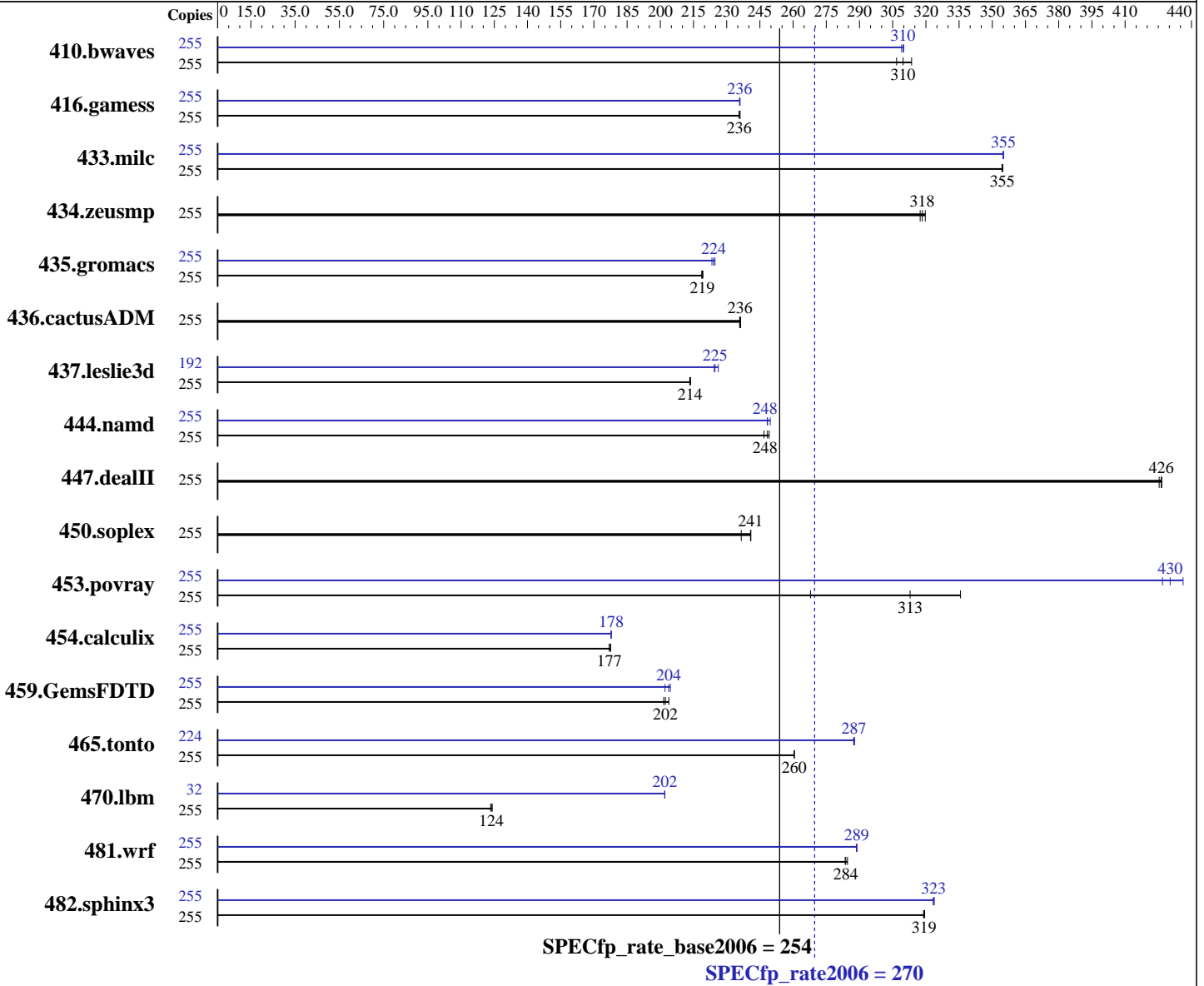
Test date: May-2009

Test sponsor: Fujitsu

Hardware Availability: Jul-2009

Tested by: Sun Microsystems

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	<b>11190</b>	<b>310</b>	255	<b>11189</b>	<b>310</b>	11180	310	11215	309
416.gamess	255	<b>21186</b>	<b>236</b>	21187	236	21151	236	255	21153	236	<b>21163</b>	<b>236</b>	21177	236
433.milc	255	6600	355	6606	354	<b>6602</b>	<b>355</b>	255	6597	355	<b>6594</b>	<b>355</b>	6593	355
434.zeusmp	255	7258	320	7311	317	<b>7289</b>	<b>318</b>	255	7258	320	7311	317	<b>7289</b>	<b>318</b>
435.gromacs	255	8326	219	8304	219	<b>8314</b>	<b>219</b>	255	8153	223	8102	225	<b>8125</b>	<b>224</b>
436.cactusADM	255	<b>12910</b>	<b>236</b>	12921	236	12895	236	255	<b>12910</b>	<b>236</b>	12921	236	12895	236
437.leslie3d	255	11238	213	<b>11227</b>	<b>214</b>	11218	214	192	<b>8032</b>	<b>225</b>	7978	226	8043	224
444.namd	255	<b>8233</b>	<b>248</b>	8207	249	8285	247	255	8191	250	8236	248	<b>8231</b>	<b>248</b>
447.dealII	255	6839	427	<b>6842</b>	<b>426</b>	6858	425	255	6839	427	<b>6842</b>	<b>426</b>	6858	425
450.soplex	255	8989	237	<b>8834</b>	<b>241</b>	8827	241	255	8989	237	<b>8834</b>	<b>241</b>	8827	241
453.povray	255	<b>4336</b>	<b>313</b>	4042	336	5064	268	255	3178	427	3110	436	<b>3152</b>	<b>430</b>
454.calculix	255	11846	178	11885	177	<b>11883</b>	<b>177</b>	255	11837	178	11826	178	<b>11831</b>	<b>178</b>
459.GemsFDTD	255	<b>13373</b>	<b>202</b>	13272	204	13423	202	255	<b>13276</b>	<b>204</b>	13227	205	13385	202
465.tonto	255	9630	261	9634	260	<b>9634</b>	<b>260</b>	224	7670	287	<b>7668</b>	<b>287</b>	7659	288
470.lbm	255	<b>28328</b>	<b>124</b>	28242	124	28409	123	32	2176	202	<b>2177</b>	<b>202</b>	2177	202
481.wrf	255	<b>10036</b>	<b>284</b>	10046	284	10009	285	255	9869	289	9860	289	<b>9867</b>	<b>289</b>
482.sphinx3	255	15558	319	<b>15571</b>	<b>319</b>	15583	319	255	15349	324	15371	323	<b>15368</b>	<b>323</b>

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.



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## 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



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## 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
```



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## 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
```

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## 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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