SPEC® CFP2006 Result

Fujitsu Limited

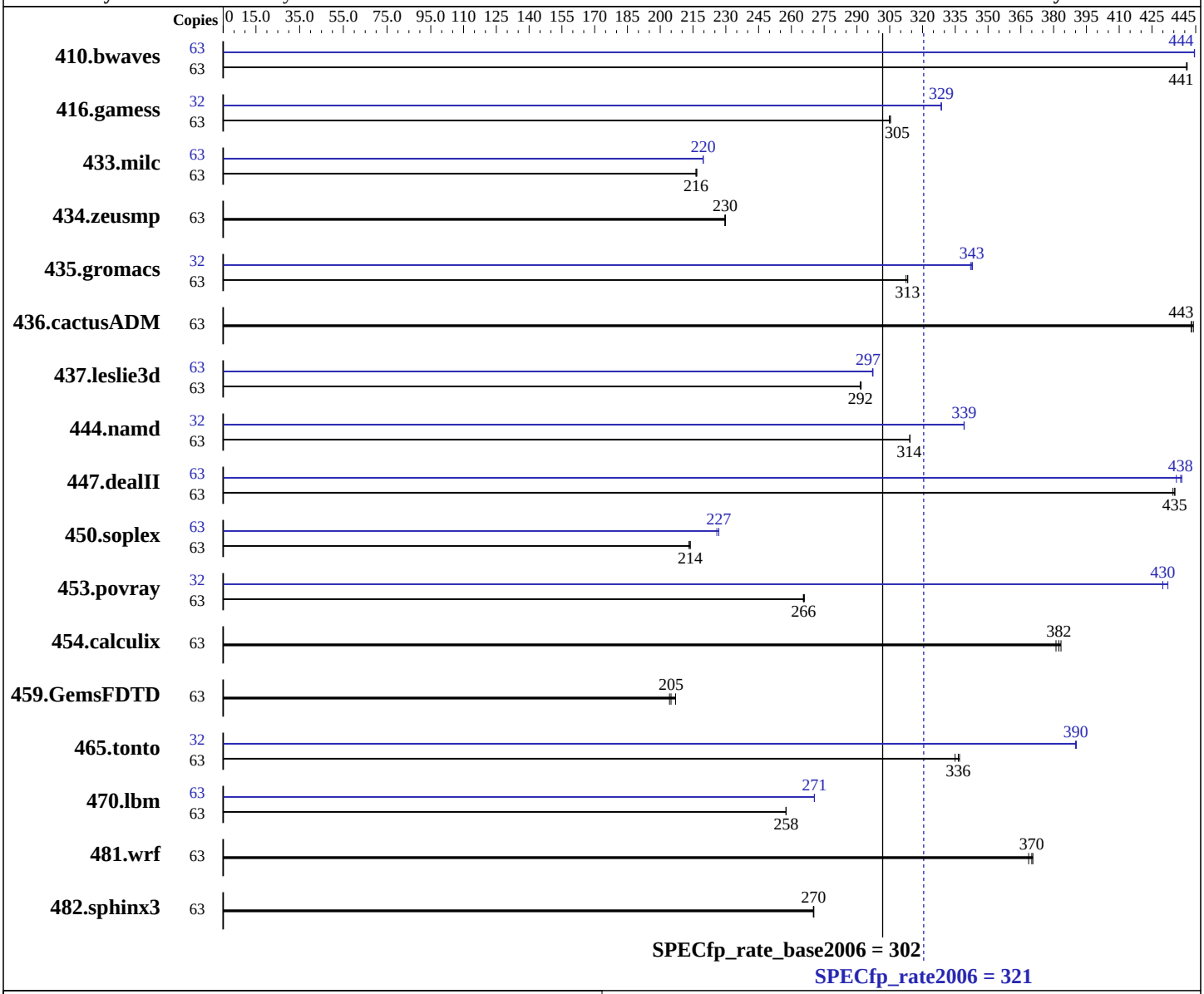
Fujitsu SPARC Enterprise M8000

SPECfp®_rate2006 = 321

SPECfp_rate_base2006 = 302

CPU2006 license: 19
Test sponsor: Fujitsu Limited
Tested by: Sun Microsystems

Test date: Apr-2007
Hardware Availability: Apr-2007
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

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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.

Tested with SPEC CPU2006 v1.0.1.
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