



# SPEC<sup>®</sup> CINT2006 Result

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Fujitsu Limited

SPECint<sup>®</sup>\_rate2006 = 335

Fujitsu SPARC Enterprise M8000

SPECint\_rate\_base2006 = 285

CPU2006 license: 19

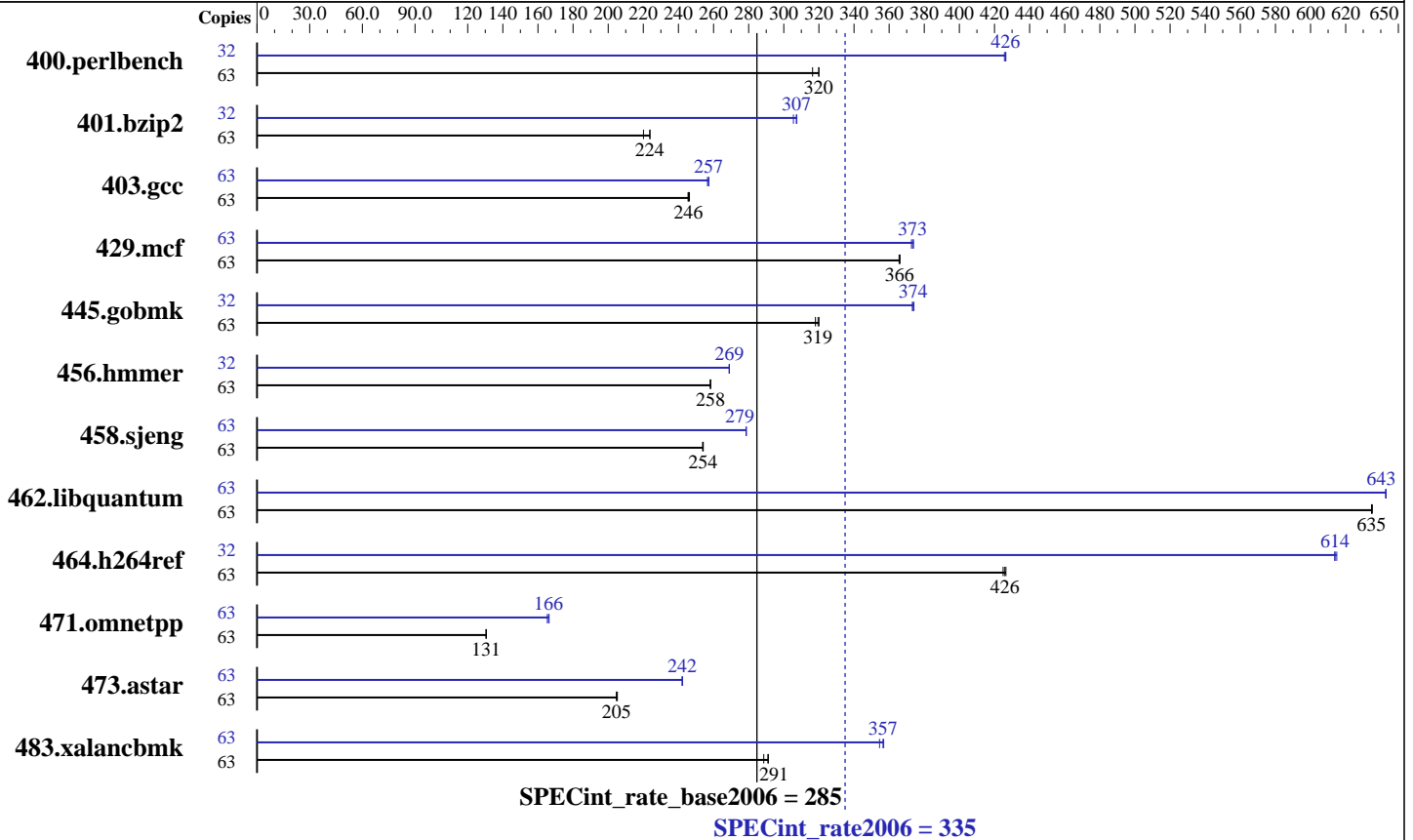
Test sponsor: Fujitsu Limited

Tested by: Sun Microsystems

Test date: Mar-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  
 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

## 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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## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	63	1945	316	<b><u>1924</u></b>	<b><u>320</u></b>	1924	320	32	735	426	<b><u>733</u></b>	<b><u>426</u></b>	733	426
401.bzip2	63	2762	220	<b><u>2718</u></b>	<b><u>224</u></b>	2717	224	32	<b><u>1005</u></b>	<b><u>307</u></b>	1011	305	1004	307
403.gcc	63	2059	246	<b><u>2065</u></b>	<b><u>246</u></b>	2066	246	63	1977	257	<b><u>1973</u></b>	<b><u>257</u></b>	1971	257
429.mcf	63	1571	366	1569	366	<b><u>1570</u></b>	<b><u>366</u></b>	63	<b><u>1539</u></b>	<b><u>373</u></b>	1542	373	1537	374
445.gobmk	63	2078	318	<b><u>2069</u></b>	<b><u>319</u></b>	2065	320	32	897	374	<b><u>898</u></b>	<b><u>374</u></b>	899	373
456.hammer	63	2277	258	<b><u>2276</u></b>	<b><u>258</u></b>	2275	258	32	1110	269	1110	269	<b><u>1110</u></b>	<b><u>269</u></b>
458.sjeng	63	<b><u>3001</u></b>	<b><u>254</u></b>	3004	254	2999	254	63	2736	279	2737	279	<b><u>2737</u></b>	<b><u>279</u></b>
462.libquantum	63	2055	635	2057	635	<b><u>2056</u></b>	<b><u>635</u></b>	63	2030	643	<b><u>2030</u></b>	<b><u>643</u></b>	2031	643
464.h264ref	63	3281	425	<b><u>3274</u></b>	<b><u>426</u></b>	3269	427	32	1152	615	1154	614	<b><u>1153</u></b>	<b><u>614</u></b>
471.omnetpp	63	3018	130	3017	131	<b><u>3017</u></b>	<b><u>131</u></b>	63	2382	165	2367	166	<b><u>2371</u></b>	<b><u>166</u></b>
473.astar	63	2160	205	<b><u>2160</u></b>	<b><u>205</u></b>	2155	205	63	1827	242	1825	242	<b><u>1826</u></b>	<b><u>242</u></b>
483.xalancbmk	63	1506	289	<b><u>1494</u></b>	<b><u>291</u></b>	1493	291	63	1218	357	<b><u>1219</u></b>	<b><u>357</u></b>	1226	355

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 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.

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## Operating System Notes (Continued)

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

## Base Portability Flags

400.perlbench: -DSPEC\_CPU\_SOLARIS\_SPARC

403.gcc: -DSPEC\_CPU\_SOLARIS

462.libquantum: -DSPEC\_CPU\_SOLARIS

483.xalancbmk: -DSPEC\_CPU\_SOLARIS



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## Base Optimization Flags

C benchmarks:

-fast -fma=fused -xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M  
-xprefetch\_level=2 -lbsdmalloc

C++ benchmarks:

-xdepend -library=stlport4 -fast -fma=fused  
-xcache=128/64/2:5120/256/10 -xipo=2 -xpagesize=4M -xprefetch\_level=2  
-lbsdmalloc

## Base Other Flags

C benchmarks:

-xjobs=16 -V -#

C++ benchmarks:

-xjobs=16 -verbose=diags,version

## Peak Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC

## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_SOLARIS\_SPARC

403.gcc: -DSPEC\_CPU\_SOLARIS

462.libquantum: -DSPEC\_CPU\_SOLARIS

483.xalancbmk: -DSPEC\_CPU\_SOLARIS

## Peak Optimization Flags

C benchmarks:

400.perlbench: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast  
-xcache=128/64/2:5120/256/10 -xpagesize=4M  
-xalias\_level=std -Xc -xipo=2 -xrestrict -fma=fused  
-xprefetch=latx:5 -lfast

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## Peak Optimization Flags (Continued)

401.bzip2: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -fast  
 -xcache=128/64/2:5120/256/10 -xpagesize=4M  
 -xalias\_level=strong -fma=fused -xprefetch=latx:5

403.gcc: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -fast  
 -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2  
 -xalias\_level=std -xprefetch\_level=2 -xarch=v8plusb  
 -fma=fused -ll2amm

429.mcf: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2  
 -xprefetch\_level=2 -xrestrict -xalias\_level=std  
 -W2,-Apf:l1list=3 -W2,-Apf:noninnerl1list -xprefetch=latx:5  
 -lfast

445.gobmk: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -fast  
 -xcache=128/64/2:5120/256/10 -xpagesize=4M  
 -xalias\_level=std -xrestrict -fma=fused

456.hmmer: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -fast  
 -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2  
 -fma=fused

458.sjeng: Same as 456.hmmer

462.libquantum: -fast -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2  
 -xprefetch\_level=2 -fma=fused -xprefetch=latx:3  
 -lbsdmalloc

464.h264ref: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -fast  
 -xcache=128/64/2:5120/256/10 -xpagesize=4M -xipo=2  
 -xalias\_level=std -xarch=v8plusb -ll2amm

C++ benchmarks:

471.omnetpp: -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 -xprefetch\_level=2  
 -Qoption cg -Qlp-av=0 -fma=fused -lfast

473.astar: -xdepend -library=stlport4 -fast  
 -xcache=128/64/2:5120/256/10 -xpagesize=4M  
 -xalias\_level=compatible -xipo=2 -xprefetch\_level=2  
 -fma=fused -xprefetch=latx:5 -lfast

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## Peak Optimization Flags (Continued)

```
483.xalancbmk: -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 -xprefetch_level=2
-fma=fused -xprefetch=latx:5 -lfast
```

## Peak Other Flags

C benchmarks:  
-xjobs=16 -V -#

C++ benchmarks:  
-xjobs=16 -verbose=diags,version

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>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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