SPEC® CINT2006 Result

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IBM Corporation

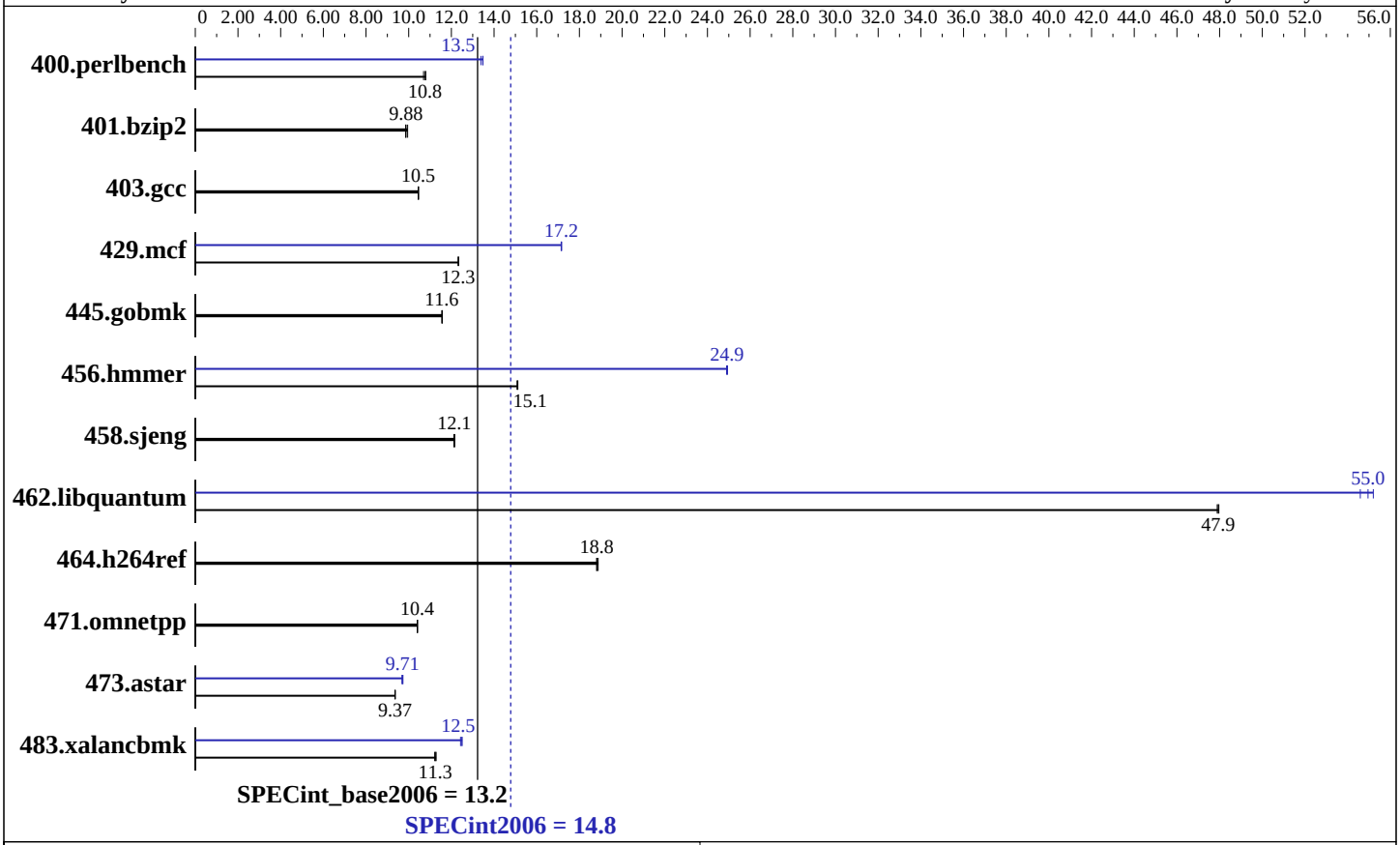
IBM System x3455 (AMD Opteron 2356)

SPECint®2006 = 14.8

SPECint_base2006 = 13.2

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: Advanced Micro Devices

Test date: Jul-2008
Hardware Availability: Jul-2008
Software Availability: May-2008



Hardware

CPU Name:	AMD Opteron 2356
CPU Characteristics:	
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	8 cores, 2 chips, 4 cores/chip
CPU(s) orderable:	1,2 chips
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	2 MB I+D on chip per chip
Other Cache:	None
Memory:	32 GB (8 x 4 GB, DDR2-667 CL5 Reg Dual Rank)
Disk Subsystem:	1 x 160 GB SATA, 7200 RPM
Other Hardware:	None

Software

Operating System:	SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
Compiler:	PGI Server Complete Version 7.2
Auto Parallel:	Yes
File System:	ReiserFS
System State:	Run level 3 (Full multiuser with network)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	SmartHeap 8.1 32-bit Library for Linux binutils 2.18.50

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	**907**	**10.8**	913	10.7	905	10.8	730	13.4	**725**	**13.5**	725	13.5
401.bzip2	970	9.95	**977**	**9.88**	979	9.86	970	9.95	**977**	**9.88**	979	9.86
403.gcc	770	10.5	770	10.5	**770**	**10.5**	770	10.5	770	10.5	**770**	**10.5**
429.mcf	**740**	**12.3**	739	12.3	740	12.3	532	17.1	**531**	**17.2**	531	17.2
445.gobmk	906	11.6	**907**	**11.6**	908	11.6	906	11.6	**907**	**11.6**	908	11.6
456.hmmer	617	15.1	**618**	**15.1**	619	15.1	374	24.9	375	24.9	**374**	**24.9**
458.sjeng	999	12.1	**997**	**12.1**	996	12.2	999	12.1	**997**	**12.1**	996	12.2
462.libquantum	432	48.0	**432**	**47.9**	433	47.9	375	55.2	380	54.6	**377**	**55.0**
464.h264ref	1172	18.9	**1176**	**18.8**	1177	18.8	1172	18.9	**1176**	**18.8**	1177	18.8
471.omnetpp	601	10.4	600	10.4	**601**	**10.4**	601	10.4	600	10.4	**601**	**10.4**
473.astar	749	9.37	750	9.35	**749**	**9.37**	725	9.68	**723**	**9.71**	721	9.73
483.xalancbmk	611	11.3	615	11.2	**613**	**11.3**	**553**	**12.5**	555	12.4	552	12.5

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

Submit Notes

```
The config file option 'submit' was used.
```

Operating System Notes

```
'numactl' was used to bind copies to the cores.
Environment stack size set to 'unlimited'.
'ulimit -l 2097152' was used to set environment locked pages in memory quantity.
NCPUS set to number of cores.
PGI_HUGE_PAGES set to 896.
Set vm/nr_hugepages=7168 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
powersave -f was used to set the CPU frequency to its maximum.
```

Base Compiler Invocation

C benchmarks:
pgcc

C++ benchmarks:
pgcpp

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-fastsse -Msmartalloc=huge:896 -Mloop32 -Mconcur=innermost
-Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-fastsse -Msmartalloc=huge:896 -Mloop32 -Mfprelaxed --zc_eh
-Mipa=fast -Mipa=inline -tp barcelona-32 -Bstatic_pgi

Base Other Flags

C benchmarks:
-Mipa=jobs:8

C++ benchmarks:
-Mipa=jobs:8

Peak Compiler Invocation

C benchmarks:
pgcc

C++ benchmarks:
pgcpp

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64

Continued on next page

Peak Portability Flags (Continued)

403.gcc: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=inline(pass 2) -fastsse -O4 -Msmartalloc=huge:896 -Mnovect -Mnounroll -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

401.bzip2: basepeak = yes

403.gcc: basepeak = yes

429.mcf: -fastsse -Msmartalloc=huge:896 -Mipa=fast -Mipa=inline:1 -tp barcelona-32 -Bstatic_pgi

445.gobmk: basepeak = yes

456.hmmer: -fastsse -Mvect=partial -Munroll=n:8 -Msmartalloc=huge:896 -Msafeptr -Mprefetch=t0 -Mfprelaxed -Mipa=const -Mipa=ptr -Mipa=arg -Mipa=inline -tp barcelona-64 -Bstatic_pgi

458.sjeng: basepeak = yes

462.libquantum: -fastsse -Munroll=m:8 -Msmartalloc=huge:896 -Mprefetch=distance:8 -Mconcur=innermost -Mconcur=noaltcode -Mfprelaxed -Mipa=fast -Mipa=noarg -tp barcelona-64 -Bstatic_pgi

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2) -Mipa=inline:6(pass 2) -fastsse -O4 -Msmartalloc=huge:896 -Msafeptr=global -Mloop32 -Mfprelaxed --zc_eh -tp barcelona-32 -Bstatic_pgi

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Peak Optimization Flags (Continued)

483.xalancbmk: `--zc_eh -fastsse -O4 -Mfprelaxed -Msmartalloc -Mipa=fast -Mipa=inline -tp barcelona-32 -Bstatic_pgi -lsmartheap`

Peak Other Flags

C benchmarks:
`-Mipa=jobs:8`

C++ benchmarks (except as noted below):
`-Mipa=jobs:8`(pass 2)

483.xalancbmk: `-Mipa=jobs:8 -L/proj/qa/smartheap/SmartHeap_8.1/lib`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/pgi72_flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/pgi72_flags.xml`

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