SPEC® CINT2006 Result

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IBM Corporation

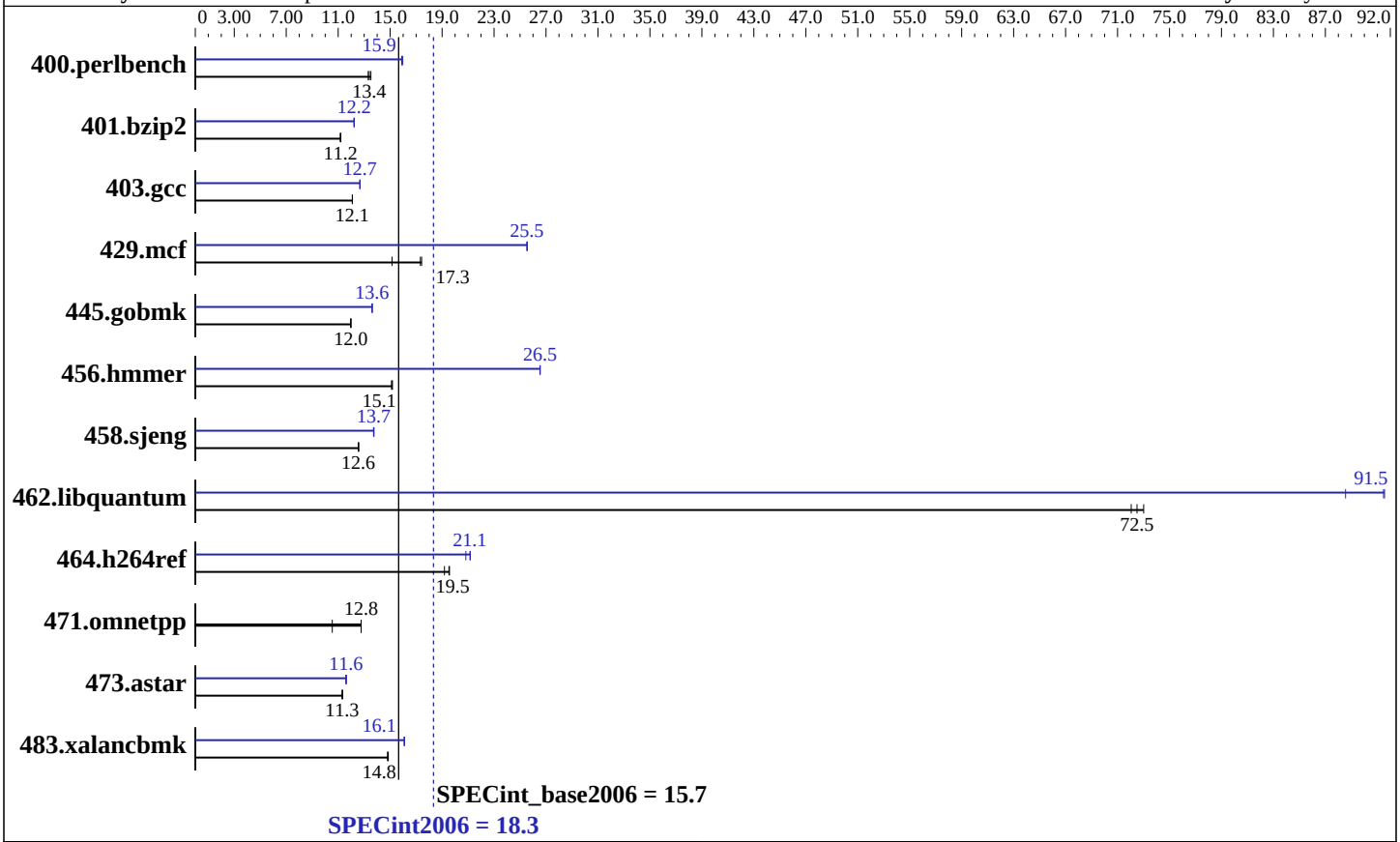
IBM BladeCenter LS42 (AMD Opteron 8376 HE)

SPECint®2006 = 18.3

SPECint_base2006 = 15.7

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Feb-2009
Hardware Availability: Mar-2009
Software Availability: May-2008



Hardware

CPU Name:	AMD Opteron 8376 HE
CPU Characteristics:	
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	8 cores, 2 chips, 4 cores/chip
CPU(s) orderable:	1,2,3,4 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:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	32 GB (8 x 4 GB DDR2-6400 ECC)
Disk Subsystem:	1 x 73 GB SAS, 10000 RPM
Other Hardware:	None

Software

Operating System:	SuSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-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:	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	723	13.5	734	13.3	**729**	**13.4**	**614**	**15.9**	615	15.9	612	16.0
401.bzip2	**863**	**11.2**	861	11.2	865	11.2	790	12.2	**789**	**12.2**	789	12.2
403.gcc	666	12.1	665	12.1	**666**	**12.1**	636	12.7	**635**	**12.7**	635	12.7
429.mcf	**526**	**17.3**	523	17.4	602	15.1	357	25.5	357	25.5	**357**	**25.5**
445.gobmk	**876**	**12.0**	876	12.0	876	12.0	771	13.6	**770**	**13.6**	770	13.6
456.hmmer	615	15.2	**617**	**15.1**	617	15.1	352	26.5	**352**	**26.5**	351	26.6
458.sjeng	**963**	**12.6**	964	12.6	962	12.6	**880**	**13.7**	880	13.8	882	13.7
462.libquantum	288	72.1	284	73.0	**286**	**72.5**	**227**	**91.5**	226	91.6	234	88.6
464.h264ref	1154	19.2	**1133**	**19.5**	1131	19.6	1062	20.8	1045	21.2	**1047**	**21.1**
471.omnetpp	593	10.5	489	12.8	**490**	**12.8**	593	10.5	489	12.8	**490**	**12.8**
473.astar	619	11.3	**621**	**11.3**	621	11.3	606	11.6	**604**	**11.6**	604	11.6
483.xalancbmk	464	14.9	466	14.8	**465**	**14.8**	428	16.1	**429**	**16.1**	429	16.1

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.
'numactl' was used to bind copies to the cores
```

Operating System Notes

```
The libhugetlbfs libraries were installed using the
installation rpms that came with the distribution.

'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152'  was used to set environment locked pages in memory limit

Set vm/nr_hugepages=7168 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH to "/cpu2006/pgi72/linux_lib32:/cpu2006/pgi72/linux_lib64"
PGI_HUGE_PAGES = "7168"
SPEC_DIR = "/cpu2006"
NCPUS = "8"

Processor Performance States Disabled in BIOS
Memory ChipKill Disabled in BIOS
```

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:
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mloop32
-Mconcur=innermost -Mfprelaxed -Mipa=fast -Mipa=inline
-tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mloop32
-Mfprelaxed --zc_eh -Mipa=fast -Mipa=inline:10 -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
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)
-Mvect=cachesize:6291456 -fastsse -O4 -Msmartalloc=huge
-Mnovect -Mnounroll -Mfprelaxed -tp barcelona-64
-Bstatic_pgi

401.bzip2: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mvect=cachesize:6291456 -fastsse -O4 -Msmartalloc=huge
-Mprefetch=t0 -Mnounroll -tp barcelona-64 -Bstatic_pgi

403.gcc: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
-Msmartalloc=huge -Mprefetch=t0 -Mnodalign -Mloop32
-Mfprelaxed -tp barcelona-32 -Bstatic_pgi

429.mcf: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
-Mipa=fast -Mipa=inline:1 -tp barcelona-32 -Bstatic_pgi

445.gobmk: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
-Mvect=cachesize:6291456 -fastsse -O4 -Msmartalloc=huge
-Mnovect -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

456.hmmer: -Mvect=cachesize:6291456 -fastsse -Mvect=partial
-Munroll=n:8 -Msmartalloc=huge -Msafeptr -Mprefetch=t0
-Mfprelaxed -Mipa=const -Mipa=ptr -Mipa=arg -Mipa=inline
-tp barcelona-64 -Bstatic_pgi

Continued on next page

Peak Optimization Flags (Continued)

458.sjeng: `-Mpfi`(pass 1) `-Mpfo`(pass 2) `-Mipa=fast`(pass 2) `-Mipa=inline:1`(pass 2) `-Mipa=noarg`(pass 2) `-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed -tp barcelona-64 -Bstatic_pgi`

462.libquantum: `-Mvect=cachesize:6291456 -fastsse -Munroll=m:8 -Msmartalloc=huge -Mprefetch=distance:8 -Mconcur=innermost -Mconcur=noaltcode -Mfprelaxed -Mipa=fast -Mipa=noarg -tp barcelona-64 -Bstatic_pgi`

464.h264ref: `-Mpfi=indirect`(pass 1) `-Mpfo=indirect`(pass 2) `-Mipa=fast`(pass 2) `-Mipa=inline`(pass 2) `-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed -tp barcelona-64 -Bstatic_pgi`

C++ benchmarks:

471.omnetpp: `basepeak = yes`

473.astar: `-Mpfi`(pass 1) `-Mpfo`(pass 2) `-Mipa=fast`(pass 2) `-Mipa=inline:6`(pass 2) `-Mvect=cachesize:6291456 -fastsse -O4 -Msmartalloc=huge -Msafeptr=global -Mloop32 -Mfprelaxed --zc_eh -tp barcelona-32 -Bstatic_pgi`

483.xalancbmk: `-Mvect=cachesize:6291456 --zc_eh -fastsse -O4 -Mfprelaxed -Msmartalloc -Mipa=fast -Mipa=inline -tp barcelona-32 -Bstatic_pgi -lsmartheap`

Peak Other Flags

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

401.bzip2: `No flags used`

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_linux_flags.20090713.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.00.xml`

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Tested with SPEC CPU2006 v1.1.
Report generated on Tue Jul 22 22:31:47 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 5 March 2009.