SPEC® CINT2006 Result

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Dell Inc.

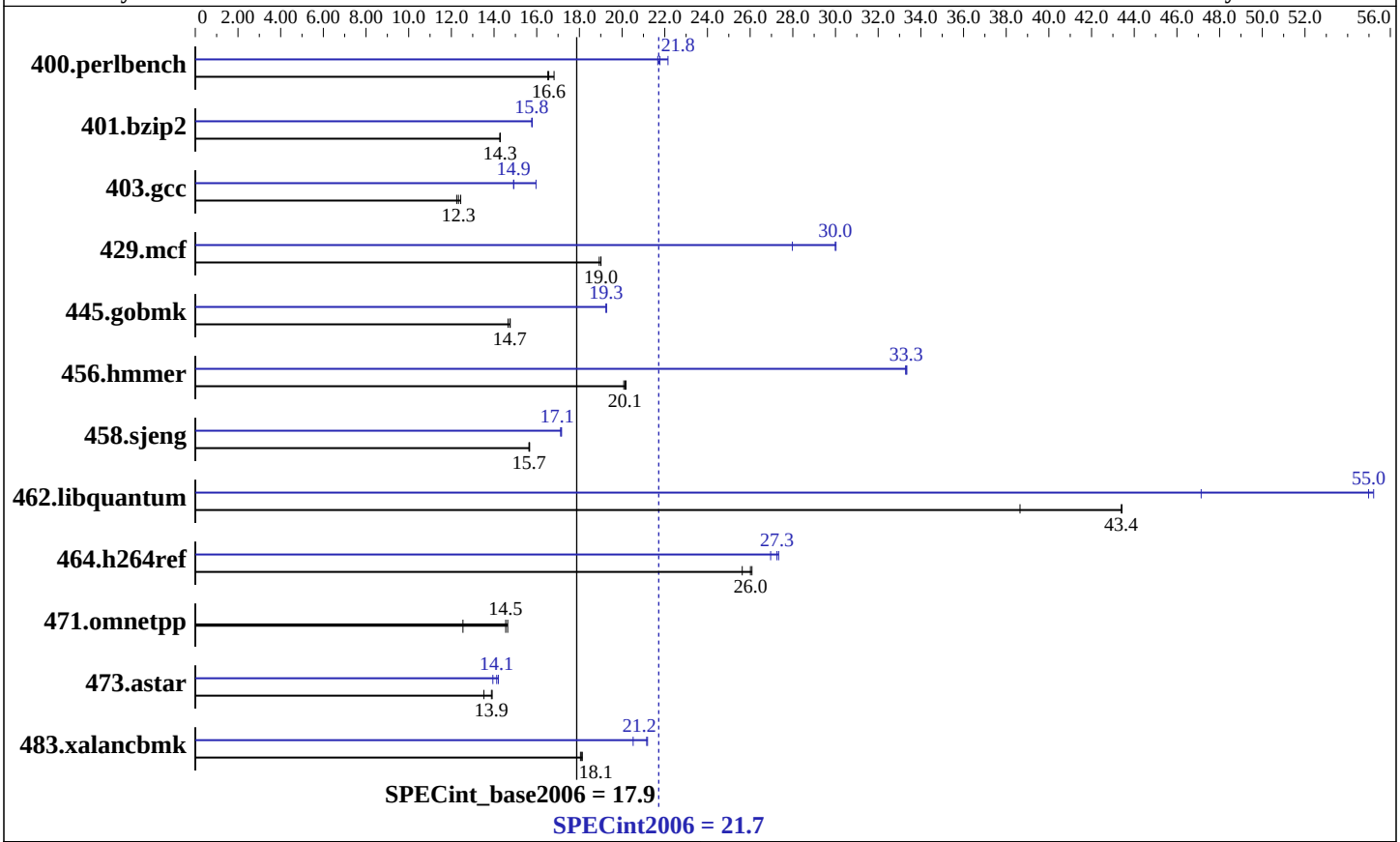
PowerEdge R905 (AMD Opteron 8389, 2.90 GHz)

SPECint®2006 = 21.7

SPECint_base2006 = 17.9

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

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



Hardware

CPU Name:	AMD Opteron 8389
CPU Characteristics:	
CPU MHz:	2900
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 cores/chip
CPU(s) orderable:	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:	64 GB (16 x 4 GB DDR2-800)
Disk Subsystem:	1 x 73 GB 10000 RPM SAS
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 PathScale Compiler Suite Version 3.2
Auto Parallel:	No
File System:	ReiserFS
System State:	Run level 3 (multi-user)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	binutils 2.18 32-bit and 64-bit libhugetlbfs libraries SmartHeap 8.1 32-bit Library for Linux

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	581	16.8	591	16.5	**590**	**16.6**	**449**	**21.8**	441	22.2	451	21.7
401.bzip2	**675**	**14.3**	675	14.3	676	14.3	**612**	**15.8**	611	15.8	612	15.8
403.gcc	**653**	**12.3**	657	12.3	647	12.4	540	14.9	**539**	**14.9**	504	16.0
429.mcf	482	18.9	**480**	**19.0**	480	19.0	**304**	**30.0**	326	28.0	304	30.0
445.gobmk	**712**	**14.7**	716	14.7	711	14.8	545	19.3	545	19.2	**545**	**19.3**
456.hmmer	**463**	**20.1**	462	20.2	465	20.1	**280**	**33.3**	280	33.3	280	33.3
458.sjeng	772	15.7	774	15.6	**773**	**15.7**	705	17.2	**706**	**17.1**	706	17.1
462.libquantum	536	38.6	477	43.4	**478**	**43.4**	375	55.2	440	47.1	**377**	**55.0**
464.h264ref	848	26.1	863	25.6	**851**	**26.0**	821	27.0	810	27.3	**812**	**27.3**
471.omnetpp	498	12.5	**430**	**14.5**	427	14.6	498	12.5	**430**	**14.5**	427	14.6
473.astar	505	13.9	**506**	**13.9**	519	13.5	503	13.9	494	14.2	**497**	**14.1**
483.xalancbmk	**381**	**18.1**	382	18.0	380	18.1	336	20.5	**326**	**21.2**	326	21.2

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=14336 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_MORECORE = "yes"
LD_LIBRARY_PATH = "/root/cpu2006-1.1/amd909gh-libs/64:/root/cpu2006-1.1/amd909gh-libs/32"
```

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 -Mfprelaxed
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
--zc_eh -Mipa=fast -Mipa=inline:10 -tp barcelona-32 -Bstatic_pgi

Base Other Flags

C benchmarks:
-Mipa=jobs:4

C++ benchmarks:
-Mipa=jobs:4

Peak Compiler Invocation

C benchmarks (except as noted below):
pathcc

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Peak Compiler Invocation (Continued)

456.hmmer: pgcc

462.libquantum: pgcc

C++ benchmarks (except as noted below):
pgcpp

483.xalancbmk: pathCC

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: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2)
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)
-L/usr/lib64 -lhugetlbfs(pass 2) -Ofast -IPA:plimit=20000
-IPA:field_reorder=on -LNO:opt=0 -WOPT:if_conv=0
-CG:local_sched_alg=1

401.bzip2: -march=barcelona -O3 -OPT:alias=disjoint -OPT:Ofast
-OPT:goto=off -INLINE:aggressive=on -CG:local_sched_alg=1
-m3dnow
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
-L/usr/lib64 -lhugetlbfs

403.gcc: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -OPT:malloc_alg=1
-LNO:trip_count=256 -LNO:prefetch_ahead=10
-CG:prefer_lru_reg=off -m32

429.mcf: -march=barcelona -O3 -ipa -INLINE:aggressive=on
-CG:gcm=off -GRA:prioritize_by_density=on -m32
-L/usr/lib -lhugetlbfs

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Peak Optimization Flags (Continued)

445.gobmk: `-march=barcelona -fb_create fbdata`(pass 1)
`-fb_opt fbdata`(pass 2)
`-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT`(pass 2)
`-L/usr/lib64 -lhugetlbfs`(pass 2) `-O3 -OPT:alias=restrict`
`-LNO:prefetch=1 -LNO:ignore_feedback=off -CG:p2align=on`

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`

458.sjeng: `-march=barcelona -fb_create fbdata`(pass 1)
`-fb_opt fbdata`(pass 2)
`-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT`(pass 2)
`-L/usr/lib64 -lhugetlbfs`(pass 2) `-O3 -ipa`
`-LNO:ignore_feedback=off -LNO:full_unroll=10 -LNO:fusion=0`
`-LNO:fission=2 -IPA:pu_reorder=2 -CG:ptr_load_use=0`
`-OPT:unroll_times_max=8 -INLINE:aggressive=on`

462.libquantum: `-Mvect=cachesize:6291456 -fastsse -Munroll=m:8`
`-Msmartalloc=huge -Mprefetch=distance:4 -Mfprelaxed`
`-Mipa=fast -Mipa=inline -Mipa=noarg -tp barcelona-64`
`-Bstatic_pgi`

464.h264ref: `-march=barcelona -fb_create fbdata`(pass 1)
`-fb_opt fbdata`(pass 2)
`-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT`(pass 2)
`-L/usr/lib64 -lhugetlbfs`(pass 2) `-O3 -IPA:plimit=20000`
`-OPT:alias=disjoint -LNO:prefetch=0 -CG:ptr_load_use=0`
`-CG:push_pop_int_saved_regs=off -CG:prefer_lru_reg=off`

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 -Mfprelaxed`
`--zc_eh -tp barcelona-32 -Bstatic_pgi`

483.xalancbmk: `-march=barcelona -Ofast -INLINE:aggressive=on -m32`
`-L/root/work/libraries/SmartHeap_8.1/lib -lsmartheap`

Peak Other Flags

C benchmarks:

Continued on next page

Peak Other Flags (Continued)

456.hmmer: `-Mipa=jobs:4`

462.libquantum: `-Mipa=jobs:4`

C++ benchmarks (except as noted below):
`-Mipa=jobs:4`(pass 2)

483.xalancbmk: `No flags used`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.html`
`http://www.spec.org/cpu2006/flags/pathscale32-flags.html`
`http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.xml`
`http://www.spec.org/cpu2006/flags/pathscale32-flags.xml`
`http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.xml`

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