# SPEC® CINT2006 Result

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## Hewlett-Packard Company

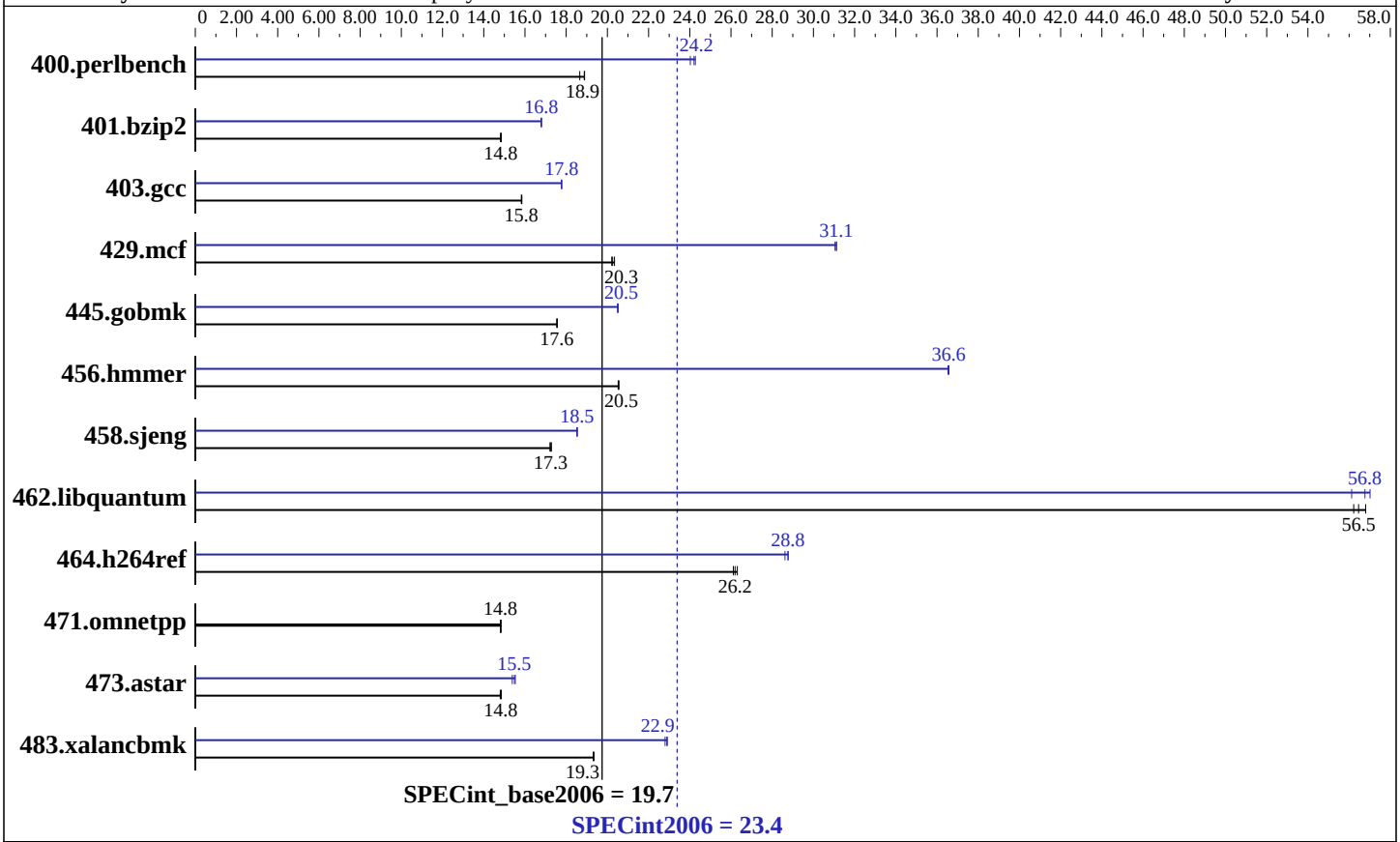
ProLiant DL585 G5
(3.1 GHz AMD Opteron 8393 SE)

SPECint®2006 = 23.4

SPECint_base2006 = 19.7

**CPU2006 license:** 3
**Test sponsor:** Hewlett-Packard Company
**Tested by:** Hewlett-Packard Company

**Test date:** Apr-2009
**Hardware Availability:** Apr-2009
**Software Availability:** Mar-2009




### Hardware

| | |
|---|---|
| CPU Name: | AMD Opteron 8393 SE |
| CPU Characteristics: | |
| CPU MHz: | 3100 |
| FPU: | Integrated |
| CPU(s) enabled: | 8 cores, 2 chips, 4 cores/chip |
| CPU(s) orderable: | 2,4 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 (8x4 GB, PC2-6400P CL5) |
| Disk Subsystem: | 1x72 GB 15 K SAS |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 5.3, Advanced Platform, Kernel 2.6.18-128.el5 |
| Compiler: | PGI Server Complete Version 8.0<br>PathScale Compiler Suite Version 3.2 |
| Auto Parallel: | Yes |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 32/64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | binutils 2.18<br>32-bit and 64-bit libhugetlbfs libraries<br>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 | **518** | **18.9** | 524 | 18.7 | 517 | 18.9 | 403 | 24.3 | **404** | **24.2** | 407 | 24.0 |
| 401.bzip2 | **651** | **14.8** | 651 | 14.8 | 650 | 14.8 | 574 | 16.8 | **574** | **16.8** | 575 | 16.8 |
| 403.gcc | **508** | **15.8** | 509 | 15.8 | 508 | 15.9 | 453 | 17.8 | 453 | 17.8 | **453** | **17.8** |
| 429.mcf | **450** | **20.3** | 448 | 20.3 | 451 | 20.2 | **293** | **31.1** | 293 | 31.1 | 294 | 31.0 |
| 445.gobmk | **598** | **17.6** | 597 | 17.6 | 598 | 17.5 | 511 | 20.5 | 512 | 20.5 | **511** | **20.5** |
| 456.hmmer | **454** | **20.5** | 455 | 20.5 | 454 | 20.6 | **255** | **36.6** | 255 | 36.6 | 255 | 36.5 |
| 458.sjeng | **701** | **17.3** | 703 | 17.2 | 700 | 17.3 | 653 | 18.5 | **653** | **18.5** | 653 | 18.5 |
| 462.libquantum | 369 | 56.2 | **367** | **56.5** | 365 | 56.8 | 369 | 56.1 | **365** | **56.8** | 363 | 57.0 |
| 464.h264ref | 841 | 26.3 | **845** | **26.2** | 847 | 26.1 | 769 | 28.8 | **769** | **28.8** | 773 | 28.6 |
| 471.omnetpp | 421 | 14.8 | **422** | **14.8** | 422 | 14.8 | 421 | 14.8 | **422** | **14.8** | 422 | 14.8 |
| 473.astar | **473** | **14.8** | 473 | 14.9 | 474 | 14.8 | **453** | **15.5** | 452 | 15.5 | 456 | 15.4 |
| 483.xalancbmk | 357 | 19.3 | **357** | **19.3** | 357 | 19.3 | 301 | 22.9 | **302** | **22.9** | 303 | 22.8 |

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

```
 Environment stack size set to 'unlimited'
 Max locked memory set to 2097152
 The libhugetlbfs libraries were installed using the
 installation rpms that came with the distribution.
 PGI_HUGE_PAGES set to 896.
 Total number of huge pages available is 7168.
 NCPUS set to number of cores
```

## Platform Notes

```
BIOS configuration:
  Power Regulator set to Static High Performance Mode
```

## General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_MORECORE = "yes"
NCPUS = "8"
```

## 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 -Mconcur=innermost
-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:6 -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:8 -Mconcur=innermost
-Mconcur=noaltcode -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/cpu2006/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/pgi80_linux_flags.20090710.00.html
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.00.html
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.00.xml
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.00.xml
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.xml


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