# SPEC® CINT2006 Result

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## Hewlett-Packard Company

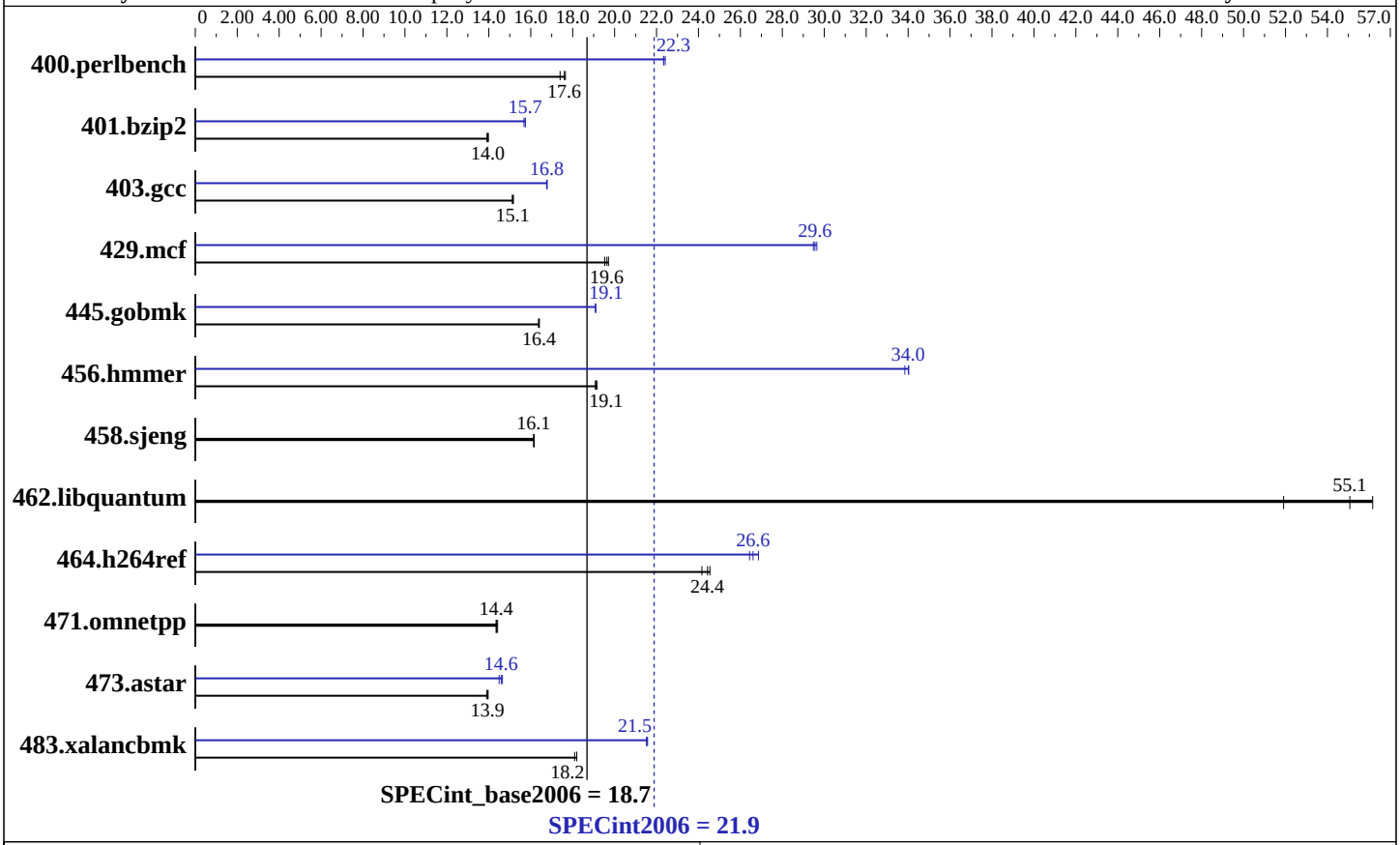
ProLiant DL385 G5p
(2.9 GHz AMD Opteron 2389)

SPECint®2006 = 21.9

SPECint_base2006 = 18.7

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

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




### Hardware

| | |
|---|---|
| CPU Name: | AMD Opteron 2389 |
| CPU Characteristics: | |
| CPU MHz: | 2900 |
| 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, 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 | **555** | **17.6** | 553 | 17.7 | 562 | 17.4 | **437** | **22.3** | 436 | 22.4 | 437 | 22.3 |
| 401.bzip2 | **691** | **14.0** | 690 | 14.0 | 694 | 13.9 | **613** | **15.7** | 613 | 15.7 | 616 | 15.7 |
| 403.gcc | 531 | 15.2 | **532** | **15.1** | 532 | 15.1 | 480 | 16.8 | **480** | **16.8** | 480 | 16.8 |
| 429.mcf | 463 | 19.7 | **465** | **19.6** | 467 | 19.5 | 308 | 29.6 | **309** | **29.6** | 309 | 29.5 |
| 445.gobmk | 641 | 16.4 | 639 | 16.4 | **640** | **16.4** | 549 | 19.1 | **550** | **19.1** | 550 | 19.1 |
| 456.hmmer | 489 | 19.1 | **488** | **19.1** | 487 | 19.2 | 274 | 34.0 | **274** | **34.0** | 276 | 33.8 |
| 458.sjeng | **750** | **16.1** | 749 | 16.2 | 750 | 16.1 | **750** | **16.1** | 749 | 16.2 | 750 | 16.1 |
| 462.libquantum | 369 | 56.2 | **376** | **55.1** | 399 | 51.9 | 369 | 56.2 | **376** | **55.1** | 399 | 51.9 |
| 464.h264ref | 916 | 24.2 | **906** | **24.4** | 902 | 24.5 | **832** | **26.6** | 837 | 26.4 | 824 | 26.9 |
| 471.omnetpp | **435** | **14.4** | 435 | 14.4 | 433 | 14.4 | **435** | **14.4** | 435 | 14.4 | 433 | 14.4 |
| 473.astar | **504** | **13.9** | 503 | 14.0 | 505 | 13.9 | 479 | 14.6 | **481** | **14.6** | 484 | 14.5 |
| 483.xalancbmk | 381 | 18.1 | **379** | **18.2** | 379 | 18.2 | 321 | 21.5 | 320 | 21.6 | **320** | **21.5** |

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

## 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

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## Base Compiler Invocation (Continued)

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

456.hmmer: pgcc

Continued on next page

## Peak Compiler Invocation (Continued)

458.sjeng: 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: `basepeak = yes`

462.libquantum: `basepeak = yes`

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:

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

458.sjeng: `-Mipa=jobs:4`

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

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

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## Peak Other Flags (Continued)

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/CPU2006_flags.20090710.00.html
http://www.spec.org/cpu2006/flags/pgi80_linux_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/CPU2006_flags.20090710.00.xml
http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.00.xml
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.xml


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