



# SPEC® CINT2006 Result

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## Hewlett-Packard Company

**SPECint®2006 = 21.1**

ProLiant DL165 G6  
(2.6 GHz AMD Opteron 2435)

**SPECint\_base2006 = 18.0**

CPU2006 license: 3

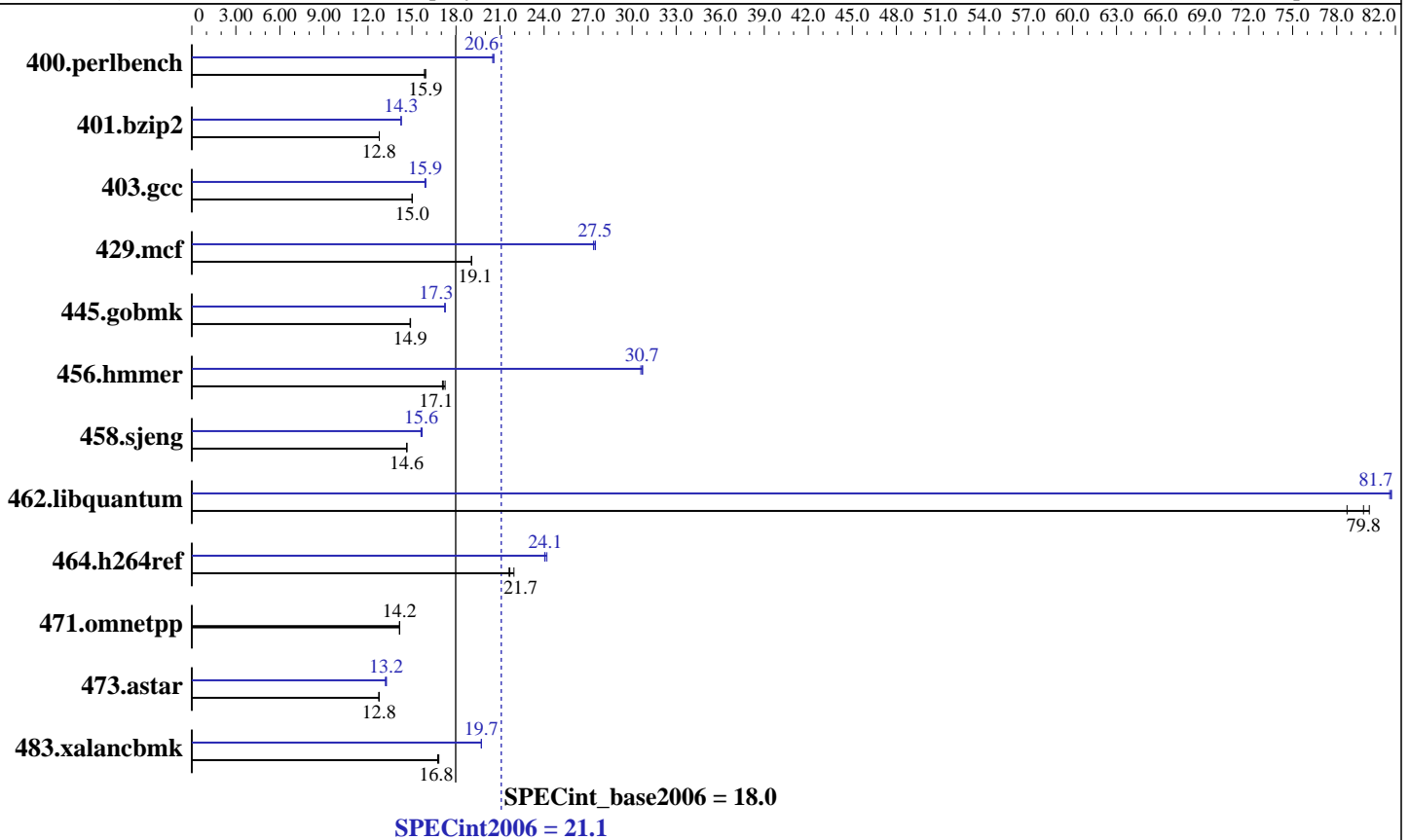
Test date: May-2009

Test sponsor: Hewlett-Packard Company

Hardware Availability: Jun-2009

Tested by: Hewlett-Packard Company

Software Availability: Apr-2009



### Hardware

CPU Name: AMD Opteron 2435  
 CPU Characteristics:  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 6 cores, 1 chip, 6 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: 6 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 16 GB (4x4 GB, PC2-6400P CL5)  
 Disk Subsystem: 1x500 GB 5.4 K RPM SATA  
 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 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 2.17.50  
 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	<b>614</b>	<b>15.9</b>	617	15.8	613	15.9	<b>475</b>	<b>20.6</b>	477	20.5	475	20.6
401.bzip2	756	12.8	756	12.8	<b>756</b>	<b>12.8</b>	676	14.3	<b>677</b>	<b>14.3</b>	677	14.3
403.gcc	536	15.0	537	15.0	<b>536</b>	<b>15.0</b>	505	15.9	<b>506</b>	<b>15.9</b>	507	15.9
429.mcf	<b>478</b>	<b>19.1</b>	478	19.1	479	19.1	332	27.5	<b>332</b>	<b>27.5</b>	333	27.4
445.gobmk	704	14.9	705	14.9	<b>705</b>	<b>14.9</b>	609	17.2	608	17.3	<b>608</b>	<b>17.3</b>
456.hammer	541	17.3	<b>545</b>	<b>17.1</b>	546	17.1	304	30.7	<b>304</b>	<b>30.7</b>	305	30.6
458.sjeng	826	14.6	826	14.6	<b>826</b>	<b>14.6</b>	775	15.6	<b>773</b>	<b>15.6</b>	771	15.7
462.libquantum	263	78.7	<b>260</b>	<b>79.8</b>	258	80.2	254	81.6	254	81.7	<b>254</b>	<b>81.7</b>
464.h264ref	<b>1021</b>	<b>21.7</b>	1024	21.6	1008	21.9	921	24.0	915	24.2	<b>919</b>	<b>24.1</b>
471.omnetpp	<b>442</b>	<b>14.2</b>	442	14.2	441	14.2	<b>442</b>	<b>14.2</b>	442	14.2	441	14.2
473.astar	550	12.8	551	12.7	<b>550</b>	<b>12.8</b>	<b>530</b>	<b>13.2</b>	532	13.2	529	13.3
483.xalancbmk	412	16.8	<b>411</b>	<b>16.8</b>	410	16.8	350	19.7	<b>350</b>	<b>19.7</b>	350	19.7

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

## Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit
The libhugetlbfs libraries were installed using the
installation rpms that came with the distribution.
PGI_HUGE_PAGES set to 450.
Total number of huge pages available is 2700.
NCPUS set to number of cores
```

## General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_MORECORE = "yes"
NCPUS = "6"
```

## Base Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks:

pgcpp



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## 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.hmmmer: -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.hmmmer: pgcc

462.libquantum: pgcc

C++ benchmarks (except as noted below):

pgcpp

483.xalancbmk: pathCC



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## 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.xalanbmk: -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

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)

```

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## Peak Optimization Flags (Continued)

458.sjeng (continued):

```
-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 -Mfprefaxed -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 -Mfprefaxed
--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

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.html](http://www.spec.org/cpu2006/flags/pgi80_linux_flags.html)

<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.00.html>

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.html)



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You can also download the XML flags sources by saving the following links:

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<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.00.xml>

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.xml)

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