



# SPEC® CINT2006 Result

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## IBM Corporation

**SPECint®2006 = 12.7**

IBM BladeCenter LS22 (AMD Opteron 2347 HE)

**SPECint\_base2006 = 11.4**

CPU2006 license: 11

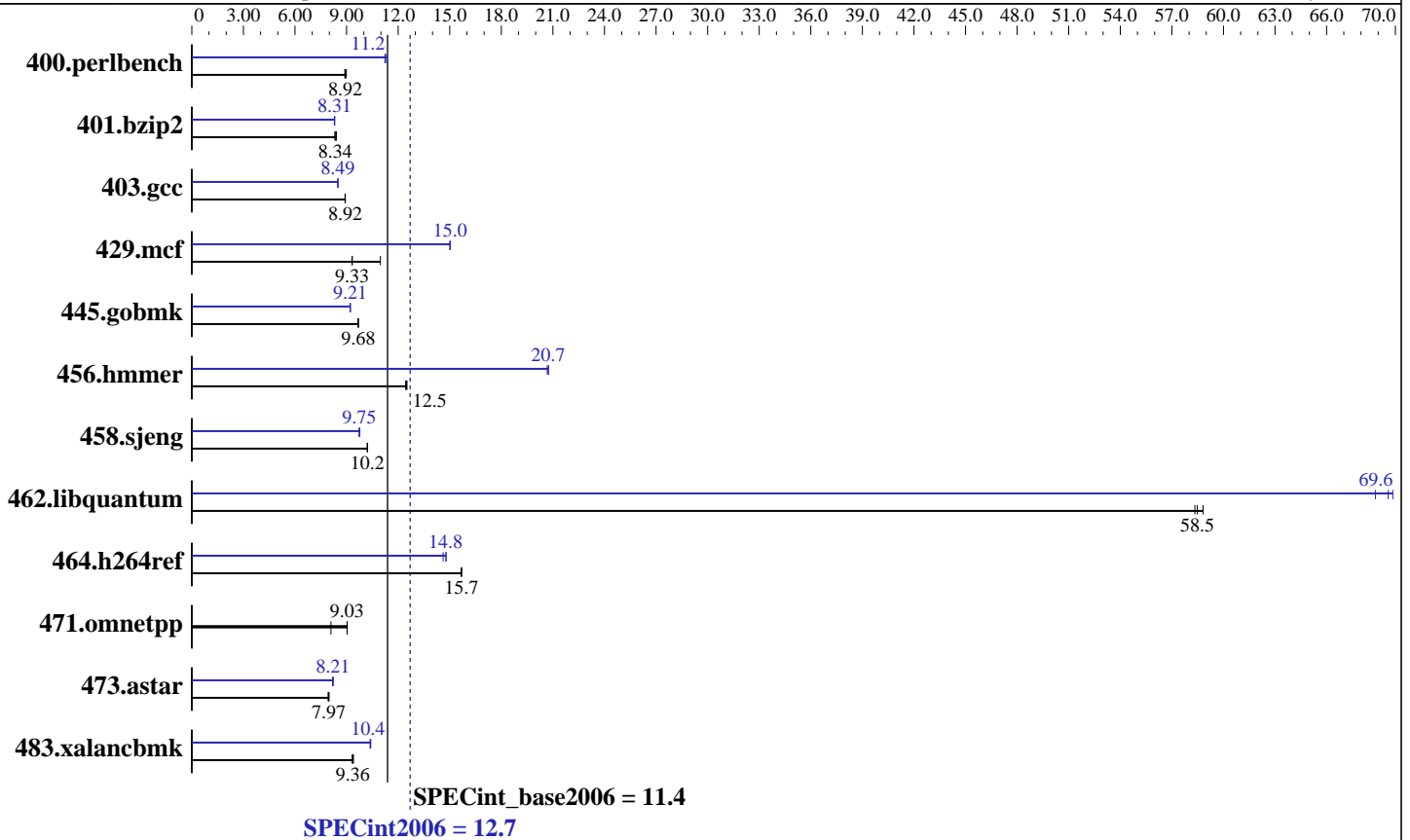
Test date: Aug-2008

Test sponsor: IBM Corporation

Hardware Availability: Sep-2008

Tested by: IBM Corporation

Software Availability: May-2008



### Hardware

CPU Name: AMD Opteron 2347 HE  
 CPU Characteristics:  
 CPU MHz: 1900  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 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: 2 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 32 GB (8 x 4 GB DDR2-6400 ECC)  
 Disk Subsystem: 1 x 36 GB SAS, 10000 RPM  
 Other Hardware: None

### Software

Operating System: SuSE Linux Enterprise Server 10 (x86\_64) SP1, Kernel 2.6.16.46-0.12-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: SmartHeap 8.1 32-bit Library for Linux 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	1098	8.90	1087	8.99	<b>1095</b>	<b>8.92</b>	<b>869</b>	<b>11.2</b>	863	11.3	870	11.2
401.bzip2	1147	8.41	<b>1157</b>	<b>8.34</b>	1160	8.32	1161	8.31	<b>1162</b>	<b>8.31</b>	1164	8.29
403.gcc	903	8.91	902	8.93	<b>902</b>	<b>8.92</b>	<b>948</b>	<b>8.49</b>	947	8.50	948	8.49
429.mcf	979	9.32	832	11.0	<b>977</b>	<b>9.33</b>	607	15.0	607	15.0	<b>607</b>	<b>15.0</b>
445.gobmk	1084	9.68	<b>1084</b>	<b>9.68</b>	1084	9.68	<b>1138</b>	<b>9.21</b>	1138	9.22	1139	9.21
456.hammer	<b>746</b>	<b>12.5</b>	750	12.4	746	12.5	450	20.7	<b>450</b>	<b>20.7</b>	451	20.7
458.sjeng	<b>1185</b>	<b>10.2</b>	1186	10.2	1184	10.2	<b>1241</b>	<b>9.75</b>	1239	9.77	1244	9.73
462.libquantum	352	58.8	<b>354</b>	<b>58.5</b>	355	58.3	<b>298</b>	<b>69.6</b>	297	69.8	301	68.8
464.h264ref	1412	15.7	<b>1411</b>	<b>15.7</b>	1411	15.7	1496	14.8	<b>1498</b>	<b>14.8</b>	1514	14.6
471.omnetpp	<b>692</b>	<b>9.03</b>	692	9.04	772	8.09	<b>692</b>	<b>9.03</b>	692	9.04	772	8.09
473.astar	886	7.93	880	7.98	<b>881</b>	<b>7.97</b>	854	8.22	<b>855</b>	<b>8.21</b>	857	8.19
483.xalancbmk	734	9.40	<b>737</b>	<b>9.36</b>	740	9.33	665	10.4	663	10.4	<b>664</b>	<b>10.4</b>

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.

## Operating System Notes

```
'numactl' was used to bind copies to the cores.
Environment stack size set to 'unlimited'.
'ulimit -l 2097152' was used to set environment locked pages in memory quantity.
NCPUS set to number of cores.
PGI_HUGE_PAGES set to 896.
Set vm/nr_hugepages=7168 in /etc/sysctl.conf
mount -t hugetlbfs none /mnt/hugepages
Processor Performance States Disabled in BIOS
Memory ChipKill Disabled in BIOS
```

## 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.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:

-fastsse -Msmartalloc=huge:896 -Mloop32 -Mconcur=innermost  
 -Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

-fastsse -Msmartalloc=huge:896 -Mloop32 -Mfprelaxed --zc\_eh  
 -Mipa=fast -Mipa=inline -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

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## Peak Portability Flags (Continued)

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) -fastsse  
 -O4 -Msmartalloc=huge:896 -Mnovect -Mnounroll -Mfprelaxed  
 -tp barcelona-64 -Bstatic\_pgi

401.bzp2: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2) -fastsse -O4  
 -Msmartalloc=huge:896 -Mprefetch=t0 -Mnounroll  
 -tp barcelona-64 -Bstatic\_pgi

403.gcc: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
 -Mipa=inline(pass 2) -fastsse -Msmartalloc=huge:896  
 -Mprefetch=t0 -Mnodalign -Mloop32 -Mfprelaxed  
 -tp barcelona-32 -Bstatic\_pgi

429.mcf: -fastsse -Msmartalloc=huge:896 -Mipa=fast -Mipa=inline:1  
 -tp barcelona-32 -Bstatic\_pgi

445.gobmk: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2) -fastsse  
 -O4 -Msmartalloc=huge:896 -Mnovect -Mfprelaxed  
 -tp barcelona-64 -Bstatic\_pgi

456.hmmer: -fastsse -Mvect=partial -Munroll=n:8 -Msmartalloc=huge:896  
 -Msafeptr -Mprefetch=t0 -Mfprelaxed -Mipa=const -Mipa=ptr  
 -Mipa=arg -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

458.sjeng: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
 -Mipa=inline:1(pass 2) -Mipa=noarg(pass 2) -fastsse  
 -Msmartalloc=huge:896 -Mfprelaxed -tp barcelona-64  
 -Bstatic\_pgi

462.libquantum: -fastsse -Munroll=m:8 -Msmartalloc=huge:896  
 -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) -fastsse  
 -Msmartalloc=huge:896 -Mfprelaxed -tp barcelona-64  
 -Bstatic\_pgi

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## Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: -Mphi(pass 1) -Mphi(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline:6(pass 2) -fastsse -O4 -Msmartalloc=huge:896  
-Msafeptr=global -Mloop32 -Mfprelaxed --zc\_eh  
-tp barcelona-32 -Bstatic\_pgi

483.xalancbmk: --zc\_eh -fastsse -O4 -Mfprelaxed -Msmartalloc -Mipa=fast  
-Mipa=inline -tp barcelona-32 -Bstatic\_pgi -lsmarheap

## 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/smarheap/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\\_flags.html](http://www.spec.org/cpu2006/flags/pgi72_flags.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/cpu2006/flags/pgi72\\_flags.xml](http://www.spec.org/cpu2006/flags/pgi72_flags.xml)

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.1.

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